# 1AC

## 1AC---SSO’s

### 1AC---Innovation ADV

#### Advantage 1 is Innovation:

#### The Ninth Circuit’s recent decision in *FTC v. Qualcomm* permits information technology firms to engage in innovation-stifling conduct with antitrust impunity. Firms have been given free reign to license standard-essential patents (SEP’s) at a surcharge and evade commitments to license on Fair, Reasonable, and Non-Discriminatory (FRAND) terms.

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Standards can enhance competition and consumer choice, but they also massively inflate the value of patents deemed essential to the standard, and give their owners the power to sue companies that implement the standard for money damages or injunctions to block them from using their SEPs. When standards cover critical features like wireless connectivity, SEP owners wield a huge amount of “hold-up” power because their patents allow them to effectively block access to the standard altogether. That lets them charge unduly large tolls to anyone who wants to implement the standard.

To minimize that risk, standard-setting organizations typically require companies that want their patented technology incorporated into a standard to promise in advance to license their SEPs to others on fair, reasonable, and non-discriminatory (FRAND) terms. But that promise strikes at a key tension between antitrust and patent law: patent owners have no obligation to let anyone use technology their patent covers, but to get those technologies incorporated into standards, patent owners usually have to promise that they will give permission to anyone who wants to implement the standard as long as they pay a reasonable license fee.

Qualcomm is one of the most important and dominant companies in the history of wireless communication standards. It is a multinational conglomerate that has owned patents on every major wireless communication standard since its first CDMA patent in 1985, and it participates in the standard-setting organizations that define those standards. Qualcomm is somewhat unique in that it not only licenses SEPs, but also supplies the modem chips used by a wide range of devices. These include chips that implement wireless communication standards, which lie at the heart of every mobile computing device.

Although Qualcomm promised to license its SEPs (including patents essential to CDMA, 3G, 4G, and 5G) on FRAND terms, its conduct has to many looked unfair, unreasonable, and highly discriminatory. In particular, Qualcomm has drawn scrutiny for bundling tens of thousands of patents together—including many that are not standard-essential—and offering portfolio-only licenses no matter what licensees actually want or need; refusing to sell modem chips to anyone without a SEP license and threatening to withhold chips from companies trying to negotiate different license terms; refusing to license anyone other than original-equipment manufacturers (OEMs); and insisting on royalties calculated as a percentage of the sale price of a handset sold to end users for hundreds of dollars, despite the minimal contribution of any particular patent to the retail value.

In 2017, the U.S. Federal Trade Commission [sued](https://www.ftc.gov/news-events/press-releases/2017/01/ftc-charges-qualcomm-monopolizing-key-semiconductor-device-used) Qualcomm for violating both sections of the Sherman Antitrust Act by engaging in a number of anticompetitive SEP licensing practices. In May 2019, the U.S. District Court for the Northern District of California agreed with the FTC, identifying numerous instances of Qualcomm’s unlawful, anticompetitive conduct in a comprehensive [233-page opinion](https://www.eff.org/document/ftc-v-qualcomm-district-court-opinion). We were pleased to see the FTC take action and the district court credit the overwhelming evidence that Qualcomm’s conduct is corrosive to market-based competition and threatens to cement Qualcomm’s dominance for years to come.

But this month, a panel of judges from the Court of Appeals for the Ninth Circuit unanimously [overturned](https://www.eff.org/document/ninth-circuit-opinion-ftc-v-qualcomm) the district court’s decision, reasoning that Qualcomm’s conduct was “hypercompetitive” but not “anticompetitive,” and therefore not a violation of antitrust law. To reach that result, the Ninth Circuit made the patent grant more powerful and antitrust law weaker than ever.

According to the Ninth Circuit, patent owners don’t have a duty to let anyone use what their patent covers, and therefore Qualcomm had no duty to license its SEPs to anyone. But that framing requires ignoring the promises Qualcomm made to license its SEPs on reasonable and non-discriminatory terms—promises that courts in this country and around the world have consistently enforced. It also means ignoring antitrust principles like the essential facilities doctrine, which limits the ability of a monopolist with hold-up power over an essential facility (like a port) to shut out rivals. Instead, the Ninth Circuit held rather simplistically that a duty to deal could arise only if the monopolist had provided access, and then reversed its policy.

But even when Qualcomm restricted its licensing policies in critical ways, the Ninth Circuit found reasons to approve those restrictions. For example, Qualcomm stopped licensing its patents to chip manufacturers and started licensing them only to OEMs. This had a major benefit: it let Qualcomm charge a much higher royalty rate based on the high retail price of the end user devices, like smartphones and tablets, that OEMs make and sell. If Qualcomm had continued to license to chip suppliers, its patents would be “exhausted” once the chips were sold to OEMs, extinguishing Qualcomm’s right to assert its patents and control how the chips were used.

Patent exhaustion is a century-old doctrine that protects the rights of consumers to use things they buy without getting the patent owner’s permission again and again. Patent exhaustion is important because it prevents price-gouging, but also because it protects space for innovation by letting people use things they buy freely, including to build innovations of their own. The doctrine thus helps patent law serve its underlying goal—promoting economic growth and innovation. In other words, the doctrine of exhaustion is baked into the patent grant; it is not optional. Nevertheless, the Ninth Circuit wholeheartedly approved of Qualcomm’s efforts to avoid exhaustion—even when that meant cutting off access to previous licensees (chip-makers) in ways that let Qualcomm charge far more in licensing fees than its SEPs could possibly have contributed to the retail value of the final product.

It makes no sense that Qualcomm could contract around a fundamental principle like patent exhaustion, but at the same time did not assume any antitrust duty to deal under these circumstances. Worse, it’s harmful for the economy, innovation, and consumers. Unfortunately, the kind of harm that antitrust law recognizes is limited to harm affecting “competition” or the “competitive process.” Antitrust law, at least as the Ninth Circuit interprets it, doesn’t do nearly enough to address the harm downstream consumers experience when they pay inflated prices for high-tech devices, and miss out on innovation that might have developed from fair, reasonable, and non-discriminatory licensing practices.

We hope the FTC sticks to its guns and asks the Ninth Circuit to go en banc and reconsider this decision. Otherwise, antitrust law will become an even weaker weapon against innovation-stifling conduct in technology markets.

#### Qualcomm’s ability to evade its FRAND commitment can be traced to a failure on the part of Standard Setting Organization’s (SSO’s) to reasonably define and enforce their IPR policies. Patent holdup is real, and antitrust enforcement is necessary to manage it.

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C. A Limited Role for Antitrust in Promoting, Not Impeding, Competition

We favor an important but limited role for antitrust to control patent holdup. One of the authors has previously expressed skepticism of broad antitrust enforcement against patent holdup.129 But the critical point Lemley made there is that, for the most part, we do not need antitrust if patent and contract law effectively enforce the private solutions SSOs have developed to the holdup problem.130 In his more temperate moments, Delrahim adds an important caveat that, if taken seriously, might align him more with us: “[A]ntitrust law should play no role in policing unilateral FRAND commitments where contract or common law remedies would be adequate.”131 Unfortunately, he seemed to drop that caveat in the joint December 2019 statement with the PTO abandoning long-standing policy on FRAND commitments. There, the Division and the PTO took the position that patentees should be entitled to a full range of patent remedies, explicitly including injunctions, even if they had committed to license the patents on FRAND terms.132 As Herbert Hovenkamp has noted, the Justice Department’s position contradicts established law on injunctive relief and FRAND.133

Even the more limited version of the statement is problematic. If courts effectively enforce FRAND commitments, most of the holdup problem can be solved without resort to antitrust. But antitrust still has an important role to play when contract law and anti-fraud laws fail to fully address the patent holdup problem.134

The FTC’s case against Qualcomm provides a good example of why antitrust is needed. In that case, the District Court found that Qualcomm had breached its FRAND commitment and used its monopoly power over modem chips to pressure its customers (Original Equipment Manufacturers, or “OEMs”) to pay a royalty surcharge for Qualcomm’s SEPs on top of the reasonable royalty rates that Qualcomm would otherwise have been able to obtain. Qualcomm imposed this surcharge when Qualcomm’s customers purchased modem chips from Qualcomm’s rivals.135 The District Court correctly found that Qualcomm’s royalty surcharge acted like a tax when Qualcomm’s customers purchased modem chips from Qualcomm’s rivals.136 Based on this reasoning, the District Court correctly found that Qualcomm’s “no-license/no-chips” policy harmed competition by raising rivals’ costs and thereby excluding them, and that this same conduct also harmed Qualcomm’s customers.137

The Ninth Circuit reversed, making basic errors of both economics and law.138 On the economics, the Ninth Circuit mistakenly concluded that “Qualcomm’s royalties are ‘chip-supplier neutral’ because Qualcomm collects them from all OEMs that license its patents, not just ‘rival’s customers.’”139 This is flatly incorrect, because the royalty surcharge reduces the gains from trade between an OEM and a rival modem-chip supplier but does not reduce the gains from trade between the OEM and Qualcomm.140 Based on this error, the Ninth Circuit states incorrectly: “The FTC identifies no such harm to competition.”141

On the law, the Ninth Circuit rejects the well-established principle that harming customers can be a way of harming competition: “[T]he primary harms the district court identified here were to the OEMs who agree to pay Qualcomm’s royalty rates—that is, Qualcomm’s customers, not its competitors. These harms were thus located outside the ‘areas of effective competition’—the markets for CDMA and premium LTE modem chips.”142 The notion that harms to customers in the relevant market are outside the scope of the antitrust laws is simply bizarre.

In any event, as noted above, the District Court also found harm to Qualcomm’s rivals in both of the relevant markets it identified. The Ninth Circuit further erred by stating that “the district court’s ‘anticompetitive surcharge’ theory fails to state a cogent theory of anticompetitive harm.”143 The Ninth Circuit’s logic at this point assumes that Qualcomm’s royalties reflect the value of its SEPs, but that is directly contrary to the District Court’s finding that Qualcomm used its monopoly over modem chips to obtain a royalty surcharge, above and beyond the royalties Qualcomm could obtain based on its SEPs.144 One cannot dismiss findings regarding the effects of a royalty surcharge by assuming away that very surcharge. Hopefully the Supreme Court will correct these blatant errors.

Qualcomm’s use of its separate monopoly power over modem chips to evade its FRAND commitment couldn’t be remedied in contract, making antitrust enforcement a necessity for reasons beyond simply enforcing the FRAND deal.145 In the standard-setting context, if a SEP owner breaches its FRAND commitment and is thereby able to charge unreasonably high royalties to device manufacturers, those royalties are likely to be passed through in large part to final consumers. Antitrust enforcement can protect consumers from these overcharges.146

But to the extent that antitrust can step back in some settings, that is only possible because the market participants have recognized and responded effectively to the patent holdup problem by requiring reasonable licensing terms, and because the courts have enforced that requirement in contract or patent law. The second prong of the Antitrust Division’s attack on FRAND commitments therefore undermines whatever merit there might be to the first prong. While on the one hand Delrahim says that we don’t need antitrust because contract and equity will solve the patent holdup problem, on the other hand he is advocating policies that make it harder for contract and patent law to solve that very problem. Threatening SSOs with liability—maybe even per se liability—for trying to stop SEP holdup undermines the very contractual solution on which Delrahim purports to rely. So too do Delrahim’s periodic claims that holdup is a good thing, or at least something we should accept,147 his incorrect claim that patent holdout is a bigger problem than patent holdup,148 and his advocacy for undoing or avoiding eBay and giving a patent owner the right to an automatic injunction.149 Indeed, under Delrahim, the Antitrust Division evidently objects even to voluntary commitments by patent owners not to seek an injunction as part of the standard-setting process.150 Ironically, this assault on SSOs and FRAND policies may actually necessitate more antitrust intervention in standard-setting. If the DOJ encourages companies like Qualcomm to ignore their FRAND commitments, and if the DOJ discourages SSOs from trying to solve the SEP holdup problem, or impedes their efforts to do so, antitrust may ultimately have to step in to protect a functioning market from SEP holdup.

CONCLUSIONS AND RECOMMENDATIONS

The theory of holdup is well-supported by a substantial body of empirical evidence. For valid conceptual and practical reasons, this empirical literature has not involved showing that large-scale actual holdups are common. Rather, the evidence generally comes in the form of efforts by private parties to contract around holdup.

The same types of evidence and the same standards regarding empirical work should be applied when testing the theory of patent holdup.

When such standards are applied, it is clear that the problem of patent holdup is substantial. Indeed, patent holdup, and especially SEP holdup, are very difficult strains of holdup to manage. Furthermore, the problem of patent holdup is quite common, since it arises whenever the efficient development of new products and services involves substantial investments that may turn out to be specific to another party’s patent portfolio. Not surprisingly, therefore, virtually all players in the high- tech industries affected by holdup participate in voluntary organizations where they agree to limit everyone’s rights (including their own) in an effort to pre-commit to avoid holdup.

Both the theory and the empirical work relating to patent holdup indicate that market participants have strong incentives to devise institutions to limit patent holdup. Considerable progress was made between 2006 and 2016 in controlling patent holdup in the United States, primarily through the courts, but also through competition policy enforcement. Unfortunately, some of that progress is now at risk due to a drastic shift in policy at the Antitrust Division of the Department of Justice. That shift is based on faulty economics, relies on flawed arguments, and is contrary to both patent law and the empirical evidence.

Rather than go backward, more forward progress is needed to manage and control patent holdup in general and SEP holdup in particular.

The costs caused by the problem of SEP holdup can be reduced if more SSOs follow the lead of the IEEE by clarifying and strengthening their patent policies. The SEP policies of many SSOs are certainly valuable, but efforts by Qualcomm and others to ignore or game their FRAND commitments show the necessity of SSOs being more explicit about just what their FRAND commitments entail.

The costs of SEP holdup can be reduced if the ITC joins the policy mainstream by recognizing that exclusion orders based on FRAND- encumbered SEPs are normally not in the public interest, provided the SEP owner has another available legal venue through which it can secure reasonable royalties. The White House reined in the ITC in 2013 when it sought to grant exclusion orders despite the patentee’s commitment to license the patents. The ITC should affirmatively apply that policy.

Most importantly, the courts should enforce reasonable SSO policies that target SEP holdup. Courts have been doing this as a matter of contract law, but patent owners seeking to engage in holdup have strong incentives to ignore or find ways to undermine, avoid, or evade their FRAND obligations. When they do so, antitrust must be willing to step in to protect competition and consumers by stopping patent holdup.

#### Anticompetitive conduct is escalating---weakened antitrust enforcement emboldens firms to follow Qualcomm’s lead, which collapses the integrity of standard-setting.

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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.

While governments can be heavily involved in standard set-ting,9 the implementation of technical standards in information technologies is largely the work of private actors. Government involvement is limited mainly to enforcement of contract, intellectual property, or antitrust law. As private actors, those involved in standard setting or compliance are fully subject to the federal antitrust laws.

This Article addresses one question: when is an SSO participant’s violation of a FRAND commitment an antitrust violation, and if it is, of what kind and what are the implications for remedies? It warns against two extremes. One is thinking that any violation of a FRAND commitment is an antitrust violation as well. In the first instance FRAND obligations are contractual, and most breaches of contract do not violate any antitrust law. The other extreme is thinking that, because a FRAND violation is a breach of contract, it cannot also be an antitrust violation. The question of an antitrust violation does not de-pend on whether the conduct breached a particular agreement but rather on whether it caused competitive harm. This can happen because the conduct restrained trade under section 1 of the Sherman Act, was unreasonably exclusionary under section 2 of the Sherman Act, or amounted to an anticompetitive condition or understanding as defined by section 3 of the Clay-ton Act.10 The end goal is to identify practices that harm com-petition, thereby injuring consumers.

The Ninth Circuit’s Qualcomm decision will make antitrust violations in the context of FRAND licensing much more difficult to prove, even in cases where anticompetitive behavior and consumer harm seem clear.11 Indeed, in this case the court itself acknowledged the harm to consumers but appeared to think that they were not entitled to protection.12 If this decision stands, FRAND obligations will to a larger extent have to be settled through private litigation and the federal antitrust enforcement agencies will have a diminished role. Anticompetitive behavior by one firm that is not effectively disciplined will lead others to do the same thing.

#### A trusted and credible system for ICT innovation is vital for rapid tech diffusion and economic growth---absent FRAND, the system will collapse.

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It is easy to take a pessimistic view about whether the system will break. If the current trend continues, the system is likely to break at some point for the simple reason that companies will not trust it anymore. The series of legal disputes witnessed over the past years – sometimes referred to as the “smartphone patent wars” – has been fodder for a pessimistic reading of “the two tales of SEPs”. While it is common in the business world that disputes over patents and licenses are settled in courts, various SEP disputes have revealed problematic aspects of the SEP market that are different from those disputes that follow the normal stream of business and contracts. Often, the SEP disputes are less concerned about the rights and boundaries of patents, and more about antitrust limits to market behavior: they concern market abusive practices and restrictions to competition as much as they are about intellectual property.

If the SEP system actually does break at some point, the consequences would be felt throughout the economy. SEPs have been a critical part of the ICT revolution. SEPs have allowed for the fast rates of innovation diffusion that the world has witnessed over the past quarter of a century. All the computer and Internet related products and services that people are now dependent upon for their private and professional lives are intricate webs of intellectual property. As many as 250,000 patents can be used to claim ownership of some technical specification or design element in a single smartphone (NYT 2012). A laptop, suggests one calculation, implements more than 250 interoperability standards (Biddle et al. 2010), and the number of SEP holders for 3G and 4G standards grew from 2 in 1994 to 130 in 2013 while the number of SEPs rose from fewer than 150 in 1994 to more than 150,000 in 2013 (Galetovic and Gupta 2016). The standardization-body ETSI has registered more than 150,000 declarations of SEPs from companies, and ETSI is just one of many bodies in the world of ICT standardization. For the 3G standard, the same body has about 24,000 patents that have been declared essential. Now, with the economy yet again on the threshold of big technological change, a trusted and credible system for creators and users of technology to standardize proprietary technology would be a boon for innovation, interoperability and – ultimately – the consumers.

And there are reasons for optimism. Although many of the problems in the SEP regimes need to be addressed, the numbers above indicate that the SEP system is in fact attractive to patent holders and SEP implementers. It is easy to see why: neither holders nor implementers are presented with alternative options that on the face of it would be far more profitable for them. In other words, there simply would not be as many patents declared as essential if both creators and users of technology believed the SEP system worked to their disadvantage or was grossly unfair. While the reality for some companies may be that legal disputes and unpredictability prompt them to find other ways than SEPs to get access to key technologies for their products, it remains the case that most stakeholders have strong economic incentives to maintain a balanced SEP system that is trusted.

First, standard essential patents are an asset for creators of technology because, by becoming essential to a standard, their volumes of sales for technologies that users value rise significantly. As many holders want to raise more revenues for their SEPs and – ideally – have the freedom to contract with buyers on their terms, they can expand their customer base when they agree to sell patented technology in accordance with a set of rules that are designed to prevent SEP holders exploiting the weakness of a customer that has grown dependent on having access to their technology.

Second, SEPs are hugely beneficial also to those that buy the licenses – the implementers or users. Through the SEP system, they can access technologies that are interoperable and work with different products and functionalities – and they can do it under conditions that, if history is a guide, in most cases give them stable and predictable terms of contract. As a consequence, both creators and users can focus on their competitive advantages and profit on the economies of scale and specialization. Downstream firms do not need to develop their own upstream technology and upstream firms do not need to package their technologies in end-customer products in order to make their products valuable.

Third, standard-setting organisations (SSOs) also have a big stake in an SEP system that works well – and, like creators and users of technology, they would stand to lose significantly if the SEP system were to collapse.

Lastly, the biggest beneficiaries are individual consumers – those who buy the end products using FRAND-conditioned SEPs. The advent of SEPs and the rules represented by FRAND have enabled a development of fast technology creation and contributed to the rapid diffusion in ICT goods and ICT-based services. The SEP system has also allowed for new competition, both between existing technologies and brands, and from new ones that have stepped into the market with the ambition to disrupt it, again to the benefit of the consumer. It is difficult to imagine that the ICT and digital development would have been as fast as it has been if SEPs had not been a central feature of the market.

The changing fortunes of companies operating in the cellular and smartphone market would not have been possible if there had not been an SEP system that supported competition. Now that the world economy is on the doorstep of new innovations that are dependent on a great number of input technologies – e.g. the Internet-of-Things, transport connectivity and intelligent vehicles – it is crucially important for the consumer that a balanced and functioning SEP system is maintained and that actors in the system converge towards it – which would ultimately meet their economic interests.

#### Growth solves nuclear war.

Henricksen 17, \*Thomas H., emeritus senior fellow at the Hoover Institution; (March 23rd, 2017, “Post-American World Order,” Hoover Institution, <http://www.hoover.org/research/post-american-world-order>)

What Is To Be Done?

The first marching order is to dodge any kind of perpetual war of the sort that George Orwell outlined in  “1984,” which engulfed the three super states of Eastasia, Eurasia, and Oceania, and made possible the totalitarian Big Brother regime. A long-running Cold War-type confrontation would almost certainly take another form than the one that ran from 1945 until the downfall of the Soviet Union.

What prescriptions can be offered in the face of the escalating competition among the three global powers? First, by staying militarily and economically strong, the United States will have the resources to deter its peers’ hawkish behavior that might otherwise trigger a major conflict. Judging by the history of the Cold War, the coming strategic chess match with Russia and China will prove tense and demanding—since all the countries boast nuclear arms and long-range ballistic missiles. Next, the United States should widen and sustain willing coalitions of partners, something at which America excels, and at which China and Russia fail conspicuously.

There can be little room for error in fraught crises among nuclear-weaponized and hostile powers. Short- and long-term standoffs are likely, as they were during the Cold War. Thus, the playbook, in part, involves a waiting game in which each power looks to its rivals to suffer grievous internal problems which could entail a collapse, as happened to the Soviet Union.

Some Chinese and Russian experts predict grave domestic problems for each other. They also entertain similar thoughts about the United States, which they view as terminally decadent and catastrophically polarized over politics, ethnicity, and the future direction of the country. So, the brewing three-way struggle also involves a systemic contest, which will test the competitors’ economic and political institutions.

At this juncture, the world is entering a standoff among the three great and several not-so-great powers. Averting war, while defending our interests, will prove a challenge, calling for deft policy, political endurance, and economic growth, as well as sufficient military force to keep at bay aggressive states or prevail over them if ever a war breaks out.

#### Absence of domestic 5G competition cedes leadership in technical standards to China.

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There is little doubt today that American superiority in the next generation of mobile communications, commonly called 5G, is a matter of extraordinary national concern. There is also little doubt that China is a strong competitor, already having outspent the United States by [$24 billion](https://www2.deloitte.com/content/dam/Deloitte/us/Documents/technology-media-telecommunications/us-tmt-5g-deployment-imperative.pdf#page=3) and planning [$411 billion](https://www.scmp.com/tech/china-tech/article/2098948/china-plans-28-trillion-yuan-capital-expenditure-create-worlds) in 5G investment over the next decade. The Chinese government has also laid out multiple national plans for establishing the country as a leader in mobile technology, and the Chinese firm Huawei is poised to be the [top smartphone manufacturer](https://www.cnbc.com/2018/11/16/huawei-aims-to-overtake-samsung-as-no-1-smartphone-player-by-2020.html) by 2020.

And what are United States companies doing about this? Bickering over patents.

For years, the leading American supplier of advanced mobile communications chips has been the San Diego-based Qualcomm. The company has been an innovator of mobile technology, but it has also been a remarkable innovator of convoluted legal strategies. As an ongoing Federal Trade Commission [lawsuit alleges](https://www.ftc.gov/news-events/press-releases/2017/01/ftc-charges-qualcomm-monopolizing-key-semiconductor-device-used), Qualcomm has used its dominant position as a chip supplier and its extensive patent holdings to weave an intricate web of patent licensing across the mobile industry. The effect of that complex licensing scheme, the FTC claims, has been to force competitor chipmakers out of the market and to extract concessions and high patent royalties from smartphone and mobile-device makers.

Qualcomm today faces only one major U.S. competitor—Intel, whose chips Apple recently [started using](https://www.cultofmac.com/484250/intel-reaping-rewards-apples-scrap-qualcomm/) instead of Qualcomm’s. Not surprisingly, Qualcomm has leveraged its patents to force a retaliatory investigation against Apple, the effect of which could be, as an administrative judge [recently determined](http://www.fosspatents.com/2018/10/itc-judge-didnt-buy-testimony-for-which.html), to boot Intel out of the mobile-chip market and leave Qualcomm as a monopoly.

It is hard to imagine that this infighting among Apple, Intel and Qualcomm is getting the United States very far in 5G, and it is harder to imagine that Qualcomm’s desired outcome would do so, either. The best path, instead, is the obvious one: allowing competition and expanding the number of firms working on 5G.

Competition encourages companies to out-innovate each other in order to grab market share. Of particular importance to 5G, competition leads to [better cybersecurity](https://morningconsult.com/opinions/in-the-race-to-5g-monopoly-considered-harmful/) in products, making them less vulnerable to hacking or misuse.

Competition is especially crucial when it comes to the technical standards that define how 5G works. These standards are the work of 3GPP, an international consortium of technology companies in the field. Chinese players such as Huawei and ZTE are major participants in 3GPP. Ensuring that 3GPP’s standards reflect American values requires having as many American companies at the negotiating table as possible—which is harder to achieve when those companies are trying to sue each other out of business.

Certainly patents themselves, as rewards for new inventions, are a driver of innovation in areas such as 5G. The problem, though, is not the existence of a patent system but the ever-expanding power of the patent laws, which encourage companies to pour dollars into complex patent licensing and assertion schemes—as companies like Qualcomm have done—rather than to perform the hard work of building new technologies. When innovation in patent strategy is more profitable than actual innovation, we lose the race to 5G and other technologies.

But don’t take my word for it. [Multiple members of Congress](https://www.patentprogress.org/2019/01/11/congress-weighs-in-on-qualcomm-and-apple-at-the-itc/), from both sides of the aisle, have denounced the use of patents to kick companies like Intel out of 5G development, predicting that such actions would “dampen the quality, innovation, competitive pricing, and in this case the preservation of a strong U.S. presence in the development of 5G and thus the national security of the United States.”

Or look to what China itself is doing. The Chinese government is handing out rewards left and right to encourage technology research and development. Indeed, it grants subsidies and financial benefits (ranging from the [ordinary](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2818503) to the [imperfect](https://funginstitute.berkeley.edu/wp-content/uploads/2013/12/patent_subsidy_Zhen.pdf) to the [bizarre](https://www.scmp.com/news/china/article/1681850/how-get-out-jail-early-china-buy-inventors-idea-and-patent-it)) to encourage its citizens to file for patents. But while China specifically encourages filing for patents, it does little to encourage using them: Patent infringement awards in court are peanuts—often only [five figures](https://scholarship.law.berkeley.edu/btlj/vol33/iss2/2/)—and most Chinese patent owners drop their patents [within five years](https://www.bloomberg.com/news/articles/2018-09-26/china-claims-more-patents-than-any-country-most-are-worthless) of getting them. The message in China is clear: You will be rewarded for innovating, but not for quibbling over patents.

The United States should take the same tack if it wants to match China in 5G. Ever-stronger patent rights encourage counterproductive disputes that are a drag on industry, a drag on research and development, and ultimately a drag on domestic competitiveness on the global stage. If America wants to lead in 5G, then it must clear the path for strong competition among leading American technology companies.

#### Standards leadership allows China to export digital authoritarianism.

Drew et al. 21, \*Dr Alexi Drew, Research Associate, The Policy Institute, King’s College London; (May 7th, 2021, “The Critical Geopolitics of Standards Setting”, https://www.transatlantic-dialogue-on-china.rusi.org/article/the-critical-geopolitics-of-standards-setting)

However, this previously ‘western’ domain is challenged by a Chinese bloc of private industry actors with centrally directed, strategic motivations for their efforts who have managed to leverage the flaws of this system for political and economic advantage.  The market-driven self-regulation model of technical standards has proven itself unsustainable given the geopolitical power achievable through the control of these standards. The marketised approach is easily abusable by a technologically developed nation-state with geopolitical intentions firmly in mind.

Obscurity Through Complexity

Technical standards have the immediate appearance of being both apolitical and ethically neutral. This seems to set them apart from the debate over standards of state behaviour in [cyber space concerning espionage and actions below the threshold of armed conflict](https://www.cfr.org/blog/unexpectedly-all-un-countries-agreed-cybersecurity-report-so-what). Yet, technological standards are unequivocally connected to normative practices of international behaviour and ethics. The extremely complex nature of the standards under consideration in bodies such as the International Organization for Standardization, the International Electrotechnical Commission (IEC), the International Telecommunications Union (ITU), and the Third Generation Partnership Project (3GPP) obscures the very tangible real-world impact that the standards they set have. The 3GPP is responsible for standards setting for mobile telecommunications. It covers everything from 5G through to autonomous vehicles and the Internet of Things. These are the bodies defining how the modern world is constructed.

On the one hand they appear quite benign, responsible for such banalities as the use of Universal Serial Bus (USB) connectors versus proprietary standards. This hardly seems a matter of national security importance. But the same process is responsible for what ultimately shape the basic operating parameters of facial recognition technology in closed circuit television systems, the level of centralised state control at the technical foundations of the internet, and the protections of personally identifiable data. These generate profound implications for international policy and ethics.

Internal Competition vs Strategic Direction

Technical standards setting processes have, historically, been dominated by private sector actors who have had both the capacity to develop a particular technology to the point of holding a significant market share, and the ability to use that market share to advocate for the standardisation of the technology in line with their own production. The market led approach has continued to be the prevailing model by which American companies have globalised the technical standards behind US dominated technological innovation. This privatised form of self-regulation for technology companies is only partially influenced by the approach taken within the EU where [some licensing of standards are controlled by state or EU led institutions.](https://www.ui.se/globalassets/ui.se-eng/publications/ui-publications/2019/ui-brief-no.-2-2019.pdf)

In contrast to this approach the Chinese model has involved a high level of state-oriented direction, oversight, and direct engagement on the creation and signing off technical standards. Efforts to harmonise and centralise technical standards domestically have become increasingly internationalised as the CCP takes this centralised, strategic approach to technical standards setting bodies such as the ITU, 3GPP, and IEC. Technical standards have also become an increasingly central component of the Digital Silk Road with the openly expressed goal of increasing uptake of Chinese technical standards in partner countries.

The implications of this clash between a system of technical standardisation that is driven by the market versus one driven by an authoritarian government subsidised model are a direct challenge to the development of free, open, and ethical technology. Standardisation mechanisms have become political, or rather there has been a gradual realisation of the political power to be gained from the control of technical standards. While the PRC might have come to this awareness first, the US and Europe have since had a rude awakening about the missed opportunity. The privatised model of technical standards setting favoured by European and US markets relies upon the dynamics of financial competition to regulate behaviour. This is in stark contrast to the statist Chinese model.

#### Causes global backsliding.

Kendall-Taylor et. al 20 \*Andrea Kendall-Taylor, senior fellow and director of the Transatlantic Security Program at the Center for a New American Security, co-author of Democracies and Authoritarian Regimes; Erica Frantz is Assistant Professor of Political Science at Michigan State University; Joseph Wright is Professor of Political Science at Pennsylvania State University; (March/April 2020, “The Digital Dictators,” Foreign Affairs, <https://www.foreignaffairs.com/articles/china/2020-02-06/digital-dictators>)

The risk that technology will usher in a wave of authoritarianism is all the more concerning because our own empirical research has indicated that beyond buttressing autocracies, digital tools are associated with an increased risk of democratic backsliding in fragile democracies. New technologies are particularly dangerous for weak democracies because many of these digital tools are dual use: technology can enhance government efficiency and provide the capacity to address challenges such as crime and terrorism, but no matter the intentions with which governments initially acquire such technology, they can also use these tools to muzzle and restrict the activities of their opponents.

#### Democracy solves a litany of existential threats.

Diamond 19, Professor of Political Science and Sociology at Stanford University, Senior Fellow at the Hoover Institution, Senior Fellow at the Freeman Spogli Institute for International Studies, PhD in Sociology from Stanford University, (Dr. Larry, Ill Winds: Saving Democracy from Russian Rage, Chinese Ambition, and American Complacency, p. 199-202)

The most obvious response to the ill winds blowing from the world’s autocracies is to help the winds of freedom blowing in the other direction. The democracies of the West cannot save themselves if they do not stand with democrats around the world. This is truer now than ever, for several reasons. We live in a globalized world, one in which models, trends, and ideas cascade across borders. Any wind of change may gather quickly and blow with gale force. People everywhere form ideas about how to govern—or simply about which forms of government and sources of power may be irresistible—based on what they see happening elsewhere. We are now immersed in a fierce global contest of ideas, information, and norms. In the digital age, that contest is moving at lightning speed, shaping how people think about their political systems and the way the world runs. As doubts about and threats to democracy are mounting in the West, this is not a contest that the democracies can afford to lose. Globalization, with its flows of trade and information, raises the stakes for us in another way. Authoritarian and badly governed regimes increasingly pose a direct threat to popular sovereignty and the rule of law in our own democracies. Covert flows of money and influence are subverting and corrupting our democratic processes and institutions. They will not stop just because Americans and others pretend that we have no stake in the future of freedom in the world. If we want to defend the core principles of self-government, transparency, and accountability in our own democracies, we have no choice but to promote them globally. It is not enough to say that dictatorship is bad and that democracy, however flawed, is still better. Popular enthusiasm for a lesser evil cannot be sustained indefinitely. People need the inspiration of a positive vision. Democracy must demonstrate that it is a just and fair political system that advances humane values and the common good. To make our republics more perfect, established democracies must not only adopt reforms to more fully include and empower their own citizens. They must also support people, groups, and institutions struggling to achieve democratic values elsewhere. The best way to counter Russian rage and Chinese ambition is to show that Moscow and Beijing are on the wrong side of history; that people everywhere yearn to be free; and that they can make freedom work to achieve a more just, sustainable, and prosperous society. In our networked age, both idealism and the harder imperatives of global power and security argue for more democracy, not less. For one thing, if we do not worry about the quality of governance in lower-income countries, we will face more and more troubled and failing states. Famine and genocide are the curse of authoritarian states, not democratic ones. Outright state collapse is the ultimate, bitter fruit of tyranny. When countries like Syria, Libya, and Afghanistan descend into civil war; when poor states in Africa cannot generate jobs and improve their citizens’ lives due to rule by corrupt and callous strongmen; when Central American societies are held hostage by brutal gangs and kleptocratic rulers, people flee—and wash up on the shores of the democracies. Europe and the United States cannot withstand the rising pressures of immigration unless they work to support better, more stable and accountable government in troubled countries. The world has simply grown too small, too flat, and too fast to wall off rotten states and pretend they are on some other planet. Hard security interests are at stake. As even the Trump administration’s 2017 National Security Strategy makes clear, the main threats to U.S. national security all stem from authoritarianism, whether in the form of tyrannies from Russia and China to Iran and North Korea or in the guise of antidemocratic terrorist movements such as ISIS.1 By supporting the development of democracy around the world, we can deny these authoritarian adversaries the geopolitical running room they seek. Just as Russia, China, and Iran are trying to undermine democracies to bend other countries to their will, so too can we contain these autocrats’ ambitions by helping other countries build effective, resilient democracies that can withstand the dictators’ malevolence. Of course, democratically elected governments with open societies will not support the American line on every issue. But no free society wants to mortgage its future to another country. The American national interest would best be secured by a pluralistic world of free countries—one in which autocrats can no longer use corruption and coercion to gobble up resources, alliances, and territory. If you look back over our history to see who has posed a threat to the United States and our allies, it has always been authoritarian regimes and empires. As political scientists have long noted, no two democracies have ever gone to war with each other—ever. It is not the democracies of the world that are supporting international terrorism, proliferating weapons of mass destruction, or threatening the territory of their neighbors.

#### Emergence of smart cities depends on IoT applications of 5G interoperability standards---absent FRAND, excessive royalties will undermine sustainable development.

Schwartz 18, \*Matt Schwartz, Privacy Fellowship Coordinator at ACT, App Association; (March 2nd, 2018, “It’s Smart to be FRANDly: How the FRAND Commitment Will Determine the Future of Smart Cities”, https://actonline.org/2018/03/02/its-smart-to-be-frandly-how-the-frand-commitment-will-determine-the-future-of-smart-cities/)

In December, we [outlined](https://actonline.org/2017/12/18/smart-cities-connecting-your-community-through-technology/%5d) the emergence of Smart Cities – cities that harness technological innovations like internet of things (IoT) devices and data analytics to improve essential infrastructure in growing urban centers. The technological foundation of Smart Cities aims to improve public safety, better allocate resources, and meet the needs of citizens more quickly.

A central element to Smart Cities is the comprehensive network of sensors and devices implemented within buildings, roads, traffic signs, and parking meters that allows them to interact with public, and potentially private-owned, infrastructure. These sensors will “speak” to one another, communicating information about energy usage, traffic density, or other elements of city management that have traditionally either been analyzed separately or not tracked at all. The potential of Smart Cities allows data to flow from previously disconnected branches of the city and be processed in real-time, unlocking previously unknown insights.

The powerful interoperability of Smart Cities will rely heavily on standardized technologies developed in organizations like the IEEE, which is responsible for standardizing the wi-fi technology we use every day. Standardized technologies often include standard-essential patents (SEPs), which, like their name suggests, are patents declared essential to an industry standard by a standards-setting organization. In simple terms, one cannot implement the standardized technology without using the patent.

Like regular patents, the users of SEPs must pay royalties or licensing fees to the patent owner before they may use it. For example, if a manufacturing company wants to make an IoT device interoperable with a 5G network, the manufacturer must pay a licensing fee to the owner of the SEP that is essential to the 5G standard. SEPs play a vital role in the new innovations we enjoy and have come to expect, and because of the value of these patents, SEP holders have the ability to demand high license fees from those who wish to implement the standard. To offset this competition issue, many SEP holders voluntarily agree to license their SEPs to any willing licensee under fair, reasonable, and non-discriminatory (FRAND) terms.

While wi-fi and LTE are standards that will be vital to Smart City deployment, countless new standardized technologies are being developed that will be integral to any fully-operational Smart City. With reasonable access to SEPs, assured by the FRAND commitment, innovators can enjoy the legal and business certainty they need to compete. While the meaning of the FRAND commitment continues to be refined – as evidenced by the development of SEP best practices recently launched by the App Association in Europe – its foundations are well-established.

But what happens when SEP holders do not abide by the FRAND licensing commitment, or simply refuse to license at all? Sadly, small and medium-sized companies would be forced to accept untenable licensing terms, but more realistically, they would be priced out of using the standard altogether. As a result, it would impose a barrier to innovation that would result in fewer products offered to consumers or cities eager to implement IoT technologies. For example, many hope the rise of autonomous vehicles will be seamlessly integrated into the Smart City network. But how beneficial would it be if only some autonomous vehicle brands are able to license the technology needed to communicate with traffic lights, simply because of the market power of a chipmaker? The FRAND commitment is an important backstop to that unfortunate possibility.

It is vital for SEP holders to honor FRAND licensing terms, if not for small and medium-sized innovators, then for the sustainability of future Smart Cities. FRAND creates a platform for innovation, providing a floor on which companies can stand, innovate, and compete. If the foundation of the FRAND commitment is reneged, American innovators pay a steep price – not only do they lose a key component of product development and market entry, but they are also left with years of expensive negotiations and litigation if they choose to challenge the licensing practice. What’s more, the confidence developed in the open standards development system is shaken, and Smart Cities have fewer choices in IoT solutions for their future.

To achieve the promise of Smart Cities, a balanced standards ecosystem is essential. We must allow small and medium-sized developers to leverage industry standards for innovation and prevent cost-prohibitive royalty structures and negotiating practices that are detrimental to competition, while also ensuring that SEP owners can protect their intellectual property and be fairly compensated for its use. The FRAND commitment continues to be the best framework to achieve this balance, and adherence to its principles will determine the future and success of Smart Cities.

#### Climate change is anthropogenic and causes extinction---5G-enabled smart cities are critical for mitigation and adaptation.

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Currently, the entire planet is at risk due to continual climate change [1–3]. The recorded increase in average temperature across the world in the past hundred years, and the associated changes attributed to this, are known as global warming. Many scientists are convinced by the published evidence that this change is anthropogenic and resulted from the elevated emission levels of global greenhouse gases (GHGs) [4,5]. Gases such as water vapor, carbon dioxide, methane, nitrous oxide, and ozone are responsible for the absorption and emission of thermal radiation. These changes in the relative quantities of the GHGs induce a proportional change in the amount of preserved solar energy. Presently, the accepted indicator for global warming is the sustained rise in the mean temperature worldwide. This definition is designed to account for the fact that there may be some localized exceptions to this rise. For example, there may be cooling experienced in a region while the global temperature may increase altogether, hence the need for average temperature. A key concern with the GHGs trapping of more heat in the atmosphere is that it affects both climate and short scale weather patterns. Consequently, it results in greater numbers of adverse weather events such as storms, heat waves, cold snaps, droughts, and fires [6]. Climate-related risks to health, livelihoods, food security, water supply, human safety, and economic growth are projected to increase with global warming of 1.5 ◦C [7] and further increase further at 2 ◦C, as shown in Figure 1. In addition, the risks to global aggregated economic growth due to the climate change impacts are projected to be lower at 1.5 ◦C than at 2 ◦C by the end of this century.

Carbon dioxide has the most substantial effect on global warming [8]. Although it was once assumed to have an ~100 year lifespan in the atmosphere, careful studies revealed that the situation is far worse, with three-quarters of the gas expected to remain for a time in the region of up to ~1000 years, with the remainder lasting for an indefinite period of time [9]. It was indicated that the present impacts of humanity on the atmosphere can certainly cause a long term problem [10]. Carbon dioxide is released when oil, coal, and other fossil fuels are burnt for the energy we use to power our homes, cars, and smartphones. By lessening its usage, we can curb our own contribution to climate change while saving money. The first challenge is eliminating the burning of coal, oil, and, eventually, natural gas. Oil is the lubricant of the global economy as it is hidden inside such ubiquitous items as plastic and corn, fundamental to the transportation of both consumers and goods. Coal is the substrate, supplying roughly half of the electricity worldwide, a percentage that is likely to grow according to the International Energy Agency (IEA). In fact, buildings contribute up to 43% of all the greenhouse gas emissions worldwide [11], even though investing in thicker insulation and other cost-effective as well as temperature-regulating strategies can save money in the long run. Investment in new infrastructures, or radical upgradation of the existing highways and transmission lines, may help to reduce greenhouse gas emissions, yielding economic growth in the developing countries.

Nations across the globe have kept very high targets to reducing their GHG discharges [12,13]. In order to meet these goals, considerable reductions in city energy usage is required. At a global scale, urban communities represent over half (55%) of the population, which is predicted to reach 68% by the middle of this century [14]. Urban areas claim ownership of the highest levels of energy use, gas emission, and also the largest local economy. As such, it is crucial for urban areas to reduce their consumption and utilize renewable sources wherever available to reduce their gas discharge levels. Smart cities often utilize digital sensors to measure and transmit data about the levels of GHGs in the city at that moment, as a means of tackling them [15]. The efficacy of such a system is thus reliant on the network used to collate and analyze the data collected as an extant network. The mobile telecommunications networks offer a convenient solution to this desire, as their pre-existence has the clear benefit of reducing costs compared to the design and implementation of a novel system. It is recognized that smart cities will certainly act as the key players meeting these ambitious targets [16,17]. In this study, we focused primarily on the potential applications of 5G network technology to control climate change in Singapore. In addition, a clear overview of the sustainability benefits of introducing 5G technology compatible smart cities, buildings, and farms in all aspects of urbanization is provided. Herein, the main purpose is to tackle the negative outcomes associated with anthropogenic climate change, with a particular focus on the contributions that are best made by the telecoms network operators.

Climate change is one of the most challenging problems that humanity has ever faced. Presently, hundreds of millions of lives, innumerable species, entire ecosystems, health, economy, and the future habitability of this planet are at risk. Fortunately, climate change is solvable, we just need to wisely exploit the existing technologies and sciences. Climate change mitigation is a pressing international need in which many management actions are required. The development of 5G technology has been largely driven by smart mobile devices and advanced communication technologies. It may thus serve as a technical enabler for a whole new range of business opportunities, energy, and facilities management, together with industrial applications. Moreover, it may enable different devices to work together seamlessly. Definitely, the 5G cellular network technology is expected to revolutionize the global industries with profound effects on the savings of energy, waste generation and recycling, and water resources management, thus reducing the climate change impacts.

### 1AC---Cybersecurity ADV

#### Advantage 2 is Cybersecurity:

#### Aggressive patent strategies create structural flaws in 5G standardization that imperils domestic cybersecurity---market competition reduces the incidence of vulnerability and severity of attacks.

Duan 20, \*Charles Duan is a senior fellow and associate director of tech & innovation policy at the R Street Institute, where he focuses his research on intellectual property issues; (2020, “OF MONOPOLIES AND MONOCULTURES: THE INTERSECTION OF PATENTS AND NATIONAL SECURITY”, Santa Clara High Technology Law Journal, 36(4), 369-405. Retrieved from <https://www2.lib.ku.edu/login?url=https://www.proquest.com/scholarly-journals/monopolies-monocultures-intersection-patents/docview/2442966690/se-2?accountid=14556>)

III. COMPETITION AND CYBERSECURITY

In addition to the historical review done so far, another approach to understanding the relationship among patents, competition, and national security is to consider the role of cybersecurity. There is little doubt that computer system vulnerabilities that enable hacking and spread of computer exploits are a threat to the nation’s defenses, so better cybersecurity is a key part of national security strategy.155

Strong competition can thus complement national security by enhancing domestic cybersecurity, and patent assertion that unduly weakens competition detracts from cybersecurity.156 Competition promotes better cybersecurity in at least two ways. First, multiple studies show that competition encourages firms to improve their products on multiple vectors including cybersecurity. Second, competition avoids a situation that security experts call a “monoculture,” which increases vulnerability to severe cyberattacks. As former Secretary of Homeland Security Michael Chertoff wrote recently, “We need competition and multiple providers, not a potentially vulnerable technological monoculture,” to guarantee national security.157 Thus, cybersecurity provides a useful lens for understanding how unfettered patent assertion and licensing can detract from national security.

A. Cybersecurity as Competitive Value-Add

Competition enhances national security by reducing the incidence of technical vulnerabilities. That effect is especially important for security sensitive systems such as mobile telecommunications.

Intuitively, a causal chain from competition to cybersecurity makes logical sense. Computer security is a value-added benefit to consumers, so firms in competitive markets are likely to use security to gain an edge over their competitors.158 In monopolized markets, though, there may be less external impetus to test products for flaws, and the monopolist may choose to focus less on security and more on new product features or increased product quality.

Economic research confirms these hypotheses about competition leading to better cybersecurity. A 2009 empirical study of web browsers considered the impact of market concentration on the amount of time that vendors took to fix security vulnerabilities as they were discovered.159 The study found that the presence of more competitors correlated with faster cybersecurity response—a reduction of 8–10 days in response time per additional market rival.160 Similarly, business researchers in 2005 modeled incentives for firms to engage in sharing of cybersecurity information, and concluded that the “inclination to share information and invest in security technologies increases as the degree of competitiveness in an industry increases.”161 Another study found that, where two software firms are in competition, at least one will be willing to take on some degree of risk and responsibility for cybersecurity, whereas a monopoly software firm will consistently fail to accept such responsibility.162 To be sure, an unpublished study from 2017 found that some market concentration can make firms more responsive to cybersecurity issues, but only to a point: “being in a dominant position reduces the positive effect of having less competitors on the responsiveness of the vendor,” and indeed the “more dominant the firm is, the less rapid it is in releasing security patches.”163 This research confirms that competition is more conducive to cybersecurity.

It is not hard to see how this applies to emerging communication technologies markets. In the absence of competition, the above research suggests that device manufacturers, chip makers, and software developers will lack incentives to respond to vulnerabilities, to share information about cybersecurity practices and issues, and to take responsibility for security matters. Mobile phone chips have had their share of cybersecurity failures already.164 The best way to flush out ongoing and future cybersecurity issues is to maintain competitive pressure at all levels of the supply chain.

B. Vulnerabilities of “Monocultures”

A second reason why monopoly undermines cybersecurity is that monopoly leads to a “monoculture” of single-vendor products, opening the door to massive systemic failure in the case of a cyberattack. Computer researchers developed the theory of software monocultures in the early 2000s, in response to the regular phenomenon of computer viruses and other attacks spreading rapidly by exploiting flaws in the dominant operating system at the time, Microsoft Windows.165 Where a computer system such as Windows has a commanding share of users, a virus that exploits a flaw in that system can quickly spread to infect a whole interconnected ecosystem. An operating system monopoly thus enables fast and easy spread of cyberattacks, and better cybersecurity would be achieved through greater diversity in online systems.166 As one research group posited, “a network architecture that supports a collection of heterogeneous network elements for the same functional capability offers a greater possibility of surviving security attacks as compared to homogeneous networks.”167

There has been considerable study of the theory that computer monocultures are naturally more vulnerable to attacks.168 In one study, computer science researchers reviewed a catalog of 6,340 software vulnerabilities recorded in 2007, to compare whether comparable software would share the same flaws.169 Of the 2,627 vulnerabilities applicable to application software (as opposed to operating systems, web scripts, and other software components), only 29 (1.1%) applied to substitute products from different vendors but providing the same functionality.170 By contrast, different versions of a single software product were found to share vulnerabilities 84.7% of the time.171 Thus, software monocultures share exploitable flaws even when there is some variation in versions across the monoculture; by contrast, diversity in software is almost guaranteed to prevent a single flaw from affecting all users.

In the case of 5G and wireless mobile communications, a monoculture is an especially concerning possibility. To the extent that systems such as smart city sensors or communication networks are widely deployed in a monoculture fashion, a widespread attack could have devastating consequences, potentially blacking out a region and affecting essential services such as 911.172 A monoculture that is vulnerable to so-called “rootkits” or “backdoors”—maliciously installed software that enable bad actors to commandeer systems—could also enable mass surveillance or spying by private hackers or foreign governments.173 The presence of systems from multiple vendors would mitigate these possibilities.

#### Insecure technical standards cause inevitable systemic grid collapse---extinction.

DeNardis 21, \*Dr. Laura DeNardis, PhD in Science and Technology Studies from Virginia Tech, Dean of the School of Communication at American University, and Gordon M. Goldstein, Adjunct Senior Fellow at the Council on Foreign Relations, (March 1st, 2021, “The Real Lesson of the Texas Power Debacle”, Lawfare, 3/1/2021, https://www.lawfareblog.com/real-lesson-texas-power-debacle)

The infrastructure was essential, ubiquitous and providing basic functionality for everything in daily life from water to heat and transportation. And in an instant it was gone, plunging tens of thousands of residents into a life-threatening crisis. This is, of course, the narrative of the recent debacle in Texas, where a winter storm overwhelmed the state’s electrical grid and brought the state to a near-total blackout. But it should also be interpreted as a preemptive warning of what Americans will face from the next generation of the internet and the new realm of cybersecurity risk it will dramatically amplify.

Both forms of infrastructure—a state-run electrical grid and the 5G and “internet of things” future to which we are rapidly hurtling—share three attributes. First, their construction reflects a lack of imagination about the danger that can quickly coalesce when seemingly remote threat scenarios become real. Second, compounding a lack of analytic imagination is an absence of preparedness. Third, for both the Texas electrical grid and the emerging internet, public policy protections are either meager or completely absent.

In planning for the resilience of its electrical grid, public officials in Texas discounted the potentially devastating disruption that could occur from unpredictable events—whether related to climate change or just a once-a-century anomaly. They also eschewed precautions other states take seriously by allowing for the interconnection of electrical grid supply chains across their borders, ostensibly because of their ideological rejection of federal regulatory oversight governing such arrangements.

As the United States builds out a new national 5G cyber-physical communications network through private service providers, Americans similarly discount the risks—myriad in their diversity and severity—that are orders of magnitude more significant than what Texas confronted recently. More physical things than people are already connected. The super empowered internet of tomorrow, known among some in the field as the “internet of everything,” will exceed by tens of billions of devices the number of connections between individuals simply communicating via social media or digital screens.

This confronts policymakers with an imminent threat: A cyber outage is no longer about losing digital communications but about losing basic societal functioning and even human life. The failure of imagination is to think of the SolarWinds attack on U.S. federal agencies and tech companies as a worst-case scenario. The failure of imagination is to think of cybersecurity through a content-centric lens rather than as possible attacks on the material world. The emergence of internet-connected cardiac devices, digitally dependent cars, and internet-connected agriculture systems portend the stakes of a cyberattack to health care, economic and social functioning, and food security.

The United States should be prepared for, and certainly not be caught by surprise by, such cyberattacks. Yet, the internet of everything is notoriously insecure. Internet-connected physical objects are not necessarily upgradeable. Nor do they come with adequate default security and encryption. The 5G infrastructure that helps connect digital objects has been at the center of debates over Chinese espionage. Industrial cyber-physical systems are based on technical standards that have not been collaboratively vetted for security and interoperability. One of the most infamous cyberattacks—the so-called Mirai botnet that took down major media sites and corporations—hijacked these insecure objects in homes to carry out the assault. The United States is not yet prepared.

Finally, in the race to conceive and deploy effective public policy responses, the U.S. government as a whole is hardly more anticipatory or synthesized in its response to potential calamity than the state of Texas. The focus of U.S. cyber policy remains on information policy issues such as disinformation, manipulation and violent speech rather than securing the digital world that now powers our material day-to-day lives. The Biden administration confronts an enormous challenge in crafting a comprehensive strategy to the cybersecurity risks foreshadowed by the ruinous experience in Texas and its management of vital infrastructure. While the digital world has leapt from two-dimensional to three-dimensional space, cyber policy has not at all jumped from 2D to 3D.

This failure of imagination, preparedness and policy protection must not be America’s cyber future; the stakes are far too high and the costs are far too great. The Texas disaster is a potent illustration of what has always been true: Our digital society and economy are extremely vulnerable and grow more porous and subject to penetration day by day. As digital sensors and cyber control systems become further embedded in physical infrastructure like energy systems, agriculture and transportation, there is no longer a separation between security of the “real” world and security of the online world. They are entangled and increasingly enmeshed—and policy has yet to catch up to either envisioning or mitigating the looming threats the U.S. confronts.

If the energy grid cannot weather a winter storm, how can it be expected to withstand a major cyberattack? What other vital forms of national infrastructure—ranging from water, bridges, highways and roads, and ultimately our day-to-day financial system—are comparably at risk? As Texas dramatizes, it is neither hyperbolic nor exaggerated to assert that our survival could now depend on securing the inevitable cyber-physical future that is accelerating with stunning rapidity.

#### Actors have the means and motivations to strike critical infrastructure.

Wintch 21, \*Timothy M. Wintch, an active-duty Major in the United States Air Force. He is currently a graduate student at the Oettinger School of Science & Technology Intelligence, National Intelligence University, in Bethesda, Maryland. Mr. Wintch has over 11 years of experience in command-and-control operations as an Air Battle Manager. He holds a Bachelor of Arts in Politics from the University of California, Santa Cruz, and a Master of Arts in Military Studies from American Military University. (April 20th, 2021, “PERSPECTIVE: Cyber and Physical Threats to the U.S. Power Grid and Keeping the Lights on”, https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/)

Among critical infrastructure sectors in the U.S., energy is perhaps the most crucial of the 16 sectors defined by the Department of Homeland Security. This sector is so vital because it provides the energy necessary to run every other critical infrastructure sector. However, the U.S. power grid, the backbone of the energy sector, is built upon an aging skeleton that is becoming increasingly vulnerable every day. Whether from terrorists or nation-states like Russia and China, the power grid is susceptible to not just physical attacks, but also to cyber intrusion as well. However, much of this threat can be mitigated if the U.S. takes the appropriate steps to safeguard the power grid and avoid a potential catastrophe in the future.

Since Sept. 11, 2001, terrorism on U.S. soil has been at the forefront of American consciousness. Critical infrastructure provides an appealing target because of the disproportionally large impact even a small attack can have on the sectors. In particular, the power grid represents a particularly lucrative target, both in terms of the ease of access and the large impact it can make. The National Research Council stated that the U.S. power grid is “vulnerable to intelligent multi-site attacks by knowledgeable attackers intent on causing maximum physical damage to key components on a wide geographical scale.”[[1]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/" \l "_ftn1) Additionally, the physical security of transmission and distribution systems is difficult due to the dispersed nature of these key components, which in turn is advantageous to attackers as it reduces the likelihood of their capture.[[2]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/" \l "_ftn2) From 2002-2012, approximately 2,500 physical attacks occurred against transmission lines and towers worldwide and approximately 500 attacks against transformer substations.[[3]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/" \l "_ftn3) Terrorists have the motivation to attack the U.S. power grid but the very nature of the grid makes it highly vulnerable. The power grid is not only at risk from physical attacks, but also nation-state cyberattacks.

One nation that has shown both the capability and intent to use attacks against critical energy infrastructure is Russia, as demonstrated in their 2015 annexation of Crimea from Ukraine. A Russian cyber threat group known as Sandworm, which used its BlackEnergy malware, attacked Ukrainian computer systems that provide remote control of the Ukraine power grid.[[4]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/" \l "_ftn4) This attack, and another in 2016, each left the capital Kiev without power, prompting cyber experts to raise concern about the same malware already existing in NATO and the U.S. power grids.[[5]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/" \l "_ftn5) In any conflict between Russia and NATO, not only would similar cyberattacks pose a threat, but so would potential physical attacks severing fuel oil and natural gas lines to Western Europe. Russia has both the capability and intent to attack critical infrastructure, particularly power grids, during future conflicts in their “hybrid warfare” approach.

Another nation that has the capability to attack critical energy infrastructure is China, representing a threat to not just the U.S. energy infrastructure but also that of our allies whose support would be vital in a major conflict. A recent NATO report highlighted this threat from China’s Belt and Road Initiative, stating that “[China’s] foreign direct investment in strategic sectors [such as energy generation and distribution] …raises questions about whether access and control over such infrastructure can be maintained, particularly in crisis when it would be required to support the military.”[[6]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/" \l "_ftn6) Like Russia, China has been active with cyber intrusions in U.S. energy infrastructure. The Mission Support Center at Idaho National Laboratory characterized these as attacks as “multiple intrusions into US ICS/SCADA [Industrial Control Systems/Supervisory Control and Data Acquisition] and smart grid tools [that] may be aimed more at intellectual property theft and gathering intelligence to bolster their own infrastructure, but it is likely that they are also using these intrusions to develop capabilities to attack the [bulk electric system], as well.”[[7]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/" \l "_ftn7) China, therefore, has both the capability and intent to conduct cyber intrusions and attacks for myriad reasons.

Another arm of this threat is the reliance the U.S. energy industry has on imports from China, especially transformers. In early 2020, federal officials seized a transformer in the port of Houston that had been imported by the Jiangsu Huapeng Transformer Company before sending it to Sandia National Laboratory in Albuquerque. Sandia is contracted by the U.S. Department of Energy for mitigating national security threats.[[8]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/" \l "_ftn8) The Wall Street Journal reported that “Mike Howard, chief executive of the Electric Power Research Institute, a utility-funded technical organization, said that the diversion of a huge, expensive transformer is so unusual – in his experience, unprecedented – that it suggests officials had significant security concerns.”[[9]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/" \l "_ftn9) Previously destined for the Washington Area Power Administration’s Ault, Colo., substation, the transformer is believed to have been seized due to “backdoor” exploitable hardware emplaced by the Chinese prior to shipment.[[10]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/#_ftn10) Shortly after these events, President Trump issued Executive Order 13920, “[Securing the United States Bulk-Power System](https://trumpwhitehouse.archives.gov/presidential-actions/executive-order-securing-united-states-bulk-power-system/),” essentially limiting the import of Chinese-built critical energy infrastructure components due to concerns about cybersecurity.[[11]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/#_ftn11) Interestingly, Jiangsu Huapeng “boasted that it supported 10 percent of New York City’s electricity load.”[[12]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/#_ftn12)

Franklin Kramer, the former Assistant Secretary of Defense for International Security Affairs, testified before a U.S. House of Representatives Energy and Commerce subcommittee during an energy and power hearing in 2011 and said that a “highly-coordinated and structured cyber, physical, or blended attack on the bulk power system, however, could result in long-term (irreparable) damage to key system components in multiple simultaneous or near-simultaneous strikes.” He added that “an outage could result with the potential to affect a wide geographic area and cause large population centers to lose power for extended periods.”[[13]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/#_ftn13) Even the inclusion of features such as smart grids to the overall grid structure poses new vulnerabilities through their connectivity. Kramer stated that “such connectivity means that the distribution system could be a key vector for a national security attack on the grid.”[[14]](https://www.hstoday.us/subject-matter-areas/infrastructure-security/perspective-cyber-and-physical-threats-to-the-u-s-power-grid-and-keeping-the-lights-on/#_ftn14)

#### Those attacks cause accidental nuclear escalation.

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Yet another pathway to escalation could arise from a cascading series of cyberstrikes and counterstrikes against vital national infrastructure rather than on military targets. All major powers, along with Iran and North Korea, have developed and deployed cyberweapons designed to disrupt and destroy major elements of an adversary’s key economic systems, such as power grids, financial systems, and transportation networks. As noted, Russia has infiltrated the U.S. electrical grid, and it is widely believed that the United States has done the same in Russia.[12](https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation#endnote12) The Pentagon has also devised a plan known as “Nitro Zeus,” intended to immobilize the entire Iranian economy and so force it to capitulate to U.S. demands or, if that approach failed, to pave the way for a crippling air and missile attack.[13](https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation#endnote12)

The danger here is that economic attacks of this sort, if undertaken during a period of tension and crisis, could lead to an escalating series of tit-for-tat attacks against ever more vital elements of an adversary’s critical infrastructure, producing widespread chaos and harm and eventually leading one side to initiate kinetic attacks on critical military targets, risking the slippery slope to nuclear conflict. For example, a Russian cyberattack on the U.S. power grid could trigger U.S. attacks on Russian energy and financial systems, causing widespread disorder in both countries and generating an impulse for even more devastating attacks. At some point, such attacks “could lead to major conflict and possibly nuclear war.”[14](https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation#endnote14)

These are by no means the only pathways to escalation resulting from the offensive use of cyberweapons. Others include efforts by third parties, such as proxy states or terrorist organizations, to provoke a global nuclear crisis by causing early-warning systems to generate false readings (“spoofing”) of missile launches. Yet, they do provide a clear indication of the severity of the threat. As states’ reliance on cyberspace grows and cyberweapons become more powerful, the dangers of unintended or accidental escalation can only grow more severe.

#### Cyber-compromised NC3 causes nuclear war.

Klare 19, \*Michael T. Klare is a professor emeritus of peace and world security studies at Hampshire College and senior visiting fellow at the Arms Control Association; (November 19th, “Cyber Battles, Nuclear Outcomes? Dangerous New Pathways to Escalation”, <https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation>)

The Nuclear-Cyber Connection

These links exist because the NC3 systems of the United States and other nuclear-armed states are heavily dependent on computers and other digital processors for virtually every aspect of their operation and because those systems are highly vulnerable to cyberattack. Every nuclear force is composed, most basically, of weapons, early-warning radars, launch facilities, and the top officials, usually presidents or prime ministers, empowered to initiate a nuclear exchange. Connecting them all, however, is an extended network of communications and data-processing systems, all reliant on cyberspace. Warning systems, ground- and space-based, must constantly watch for and analyze possible enemy missile launches. Data on actual threats must rapidly be communicated to decision-makers, who must then weigh possible responses and communicate chosen outcomes to launch facilities, which in turn must provide attack vectors to delivery systems. All of this involves operations in cyberspace, and it is in this domain that great power rivals seek vulnerabilities to exploit in a constant struggle for advantage.

The use of cyberspace to gain an advantage over adversaries takes many forms and is not always aimed at nuclear systems. China has been accused of engaging in widespread cyberespionage to steal technical secrets from U.S. firms for economic and military advantages. Russia has been accused, most extensively in the Robert Mueller report, of exploiting cyberspace to interfere in the 2016 U.S. presidential election. Nonstate actors, including terrorist groups such as al Qaeda and the Islamic State group, have used the internet for recruiting combatants and spreading fear. Criminal groups, including some thought to be allied with state actors, such as North Korea, have used cyberspace to extort money from banks, municipalities, and individuals.[4](https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation#endnote04) Attacks such as these occupy most of the time and attention of civilian and military cybersecurity organizations that attempt to thwart such attacks. Yet for those who worry about strategic stability and the risks of nuclear escalation, it is the threat of cyberattacks on NC3 systems that provokes the greatest concern.

This concern stems from the fact that, despite the immense effort devoted to protecting NC3 systems from cyberattack, no enterprise that relies so extensively on computers and cyberspace can be made 100 percent invulnerable to attack. This is so because such systems employ many devices and operating systems of various origins and vintages, most incorporating numerous software updates and “patches” over time, offering multiple vectors for attack. Electronic components can also be modified by hostile actors during production, transit, or insertion; and the whole system itself is dependent to a considerable degree on the electrical grid, which itself is vulnerable to cyberattack and is far less protected. Experienced “cyberwarriors” of every major power have been working for years to probe for weaknesses in these systems and in many cases have devised cyberweapons, typically, malicious software (malware) and computer viruses, to exploit those weaknesses for military advantage.[5](https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation#endnote05)

Although activity in cyberspace is much more difficult to detect and track than conventional military operations, enough information has become public to indicate that the major nuclear powers, notably China, Russia, and the United States, along with such secondary powers as Iran and North Korea, have established extensive cyberwarfare capabilities and engage in offensive cyberoperations on a regular basis, often aimed at critical military infrastructure. “Cyberspace is a contested environment where we are in constant contact with adversaries,” General Paul M. Nakasone, commander of the U.S. Cyber Command (Cybercom), told the Senate Armed Services Committee in February 2019. “We see near-peer competitors [China and Russia] conducting sustained campaigns below the level of armed conflict to erode American strength and gain strategic advantage.”

Although eager to speak of adversary threats to U.S. interests, Nakasone was noticeably but not surprisingly reluctant to say much about U.S. offensive operations in cyberspace. He acknowledged, however, that Cybercom took such action to disrupt possible Russian interference in the 2018 midterm elections. “We created a persistent presence in cyberspace to monitor adversary actions and crafted tools and tactics to frustrate their efforts,” he testified in February. According to press accounts, this included a cyberattack aimed at paralyzing the Internet Research Agency, a “troll farm” in St. Petersburg said to have been deeply involved in generating disruptive propaganda during the 2016 presidential elections.[6](https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation#endnote06)

Other press investigations have disclosed two other offensive operations undertaken by the United States. One called “Olympic Games” was intended to disrupt Iran’s drive to increase its uranium-enrichment capacity by sabotaging the centrifuges used in the process by infecting them with the so-called Stuxnet virus. Another left of launch effort was intended to cause malfunctions in North Korean missile tests.[7](https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation#endnote07) Although not aimed at either of the U.S. principal nuclear adversaries, those two attacks demonstrated a willingness and capacity to conduct cyberattacks on the nuclear infrastructure of other states.

Efforts by strategic rivals of the United States to infiltrate and eventually degrade U.S. nuclear infrastructure are far less documented but thought to be no less prevalent. Russia, for example, is believed to have planted malware in the U.S. electrical utility grid, possibly with the intent of cutting off the flow of electricity to critical NC3 facilities in the event of a major crisis.[8](https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation#endnote08) Indeed, every major power, including the United States, is believed to have crafted cyberweapons aimed at critical NC3 components and to have implanted malware in enemy systems for potential use in some future confrontation.

Pathways to Escalation

Knowing that the NC3 systems of the major powers are constantly being probed for weaknesses and probably infested with malware designed to be activated in a crisis, what does this say about the risks of escalation from a nonkinetic battle, that is, one fought without traditional weaponry, to a kinetic one, at first using conventional weapons and then, potentially, nuclear ones? None of this can be predicted in advance, but those analysts who have studied the subject worry about the emergence of dangerous new pathways for escalation. Indeed, several such scenarios have been identified.[9](https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation#endnote09)

The first and possibly most dangerous path to escalation would arise from the early use of cyberweapons in a great power crisis to ~~paralyze~~ undermine the vital command, control, and communications capabilities of an adversary, many of which serve nuclear and conventional forces. In the “fog of war” that would naturally ensue from such an encounter, the recipient of such an attack might fear more punishing follow-up kinetic attacks, possibly including the use of nuclear weapons, and, fearing the loss of its own arsenal, launch its weapons immediately. This might occur, for example, in a confrontation between NATO and Russian forces in east and central Europe or between U.S. and Chinese forces in the Asia-Pacific region.

Speaking of a possible confrontation in Europe, for example, James N. Miller Jr. and Richard Fontaine wrote that “both sides would have overwhelming incentives to go early with offensive cyber and counter-space capabilities to negate the other side’s military capabilities or advantages.” If these early attacks succeeded, “it could result in huge military and coercive advantage for the attacker.” This might induce the recipient of such attacks to back down, affording its rival a major victory at very low cost. Alternatively, however, the recipient might view the attacks on its critical command, control, and communications infrastructure as the prelude to a full-scale attack aimed at neutralizing its nuclear capabilities and choose to strike first. “It is worth considering,” Miller and Fontaine concluded, “how even a very limited attack or incident could set both sides on a slippery slope to rapid escalation.”[10](https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation#endnote10)

What makes the insertion of latent malware in an adversary’s NC3 systems so dangerous is that it may not even need to be activated to increase the risk of nuclear escalation. If a nuclear-armed state comes to believe that its critical systems are infested with enemy malware, its leaders might not trust the information provided by its early-warning systems in a crisis and might misconstrue the nature of an enemy attack, leading them to overreact and possibly launch their nuclear weapons out of fear they are at risk of a preemptive strike.

“The uncertainty caused by the unique character of a cyber threat could jeopardize the credibility of the nuclear deterrent and undermine strategic stability in ways that advances in nuclear and conventional weapons do not,” Page O. Stoutland and Samantha Pitts-Kiefer wrote in 2018 paper for the Nuclear Threat Initiative. “[T]he introduction of a flaw or malicious code into nuclear weapons through the supply chain that compromises the effectiveness of those weapons could lead to a lack of confidence in the nuclear deterrent,” undermining strategic stability.[11](https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation#endnote11) Without confidence in the reliability of its nuclear weapons infrastructure, a nuclear-armed state may misinterpret confusing signals from its early-warning systems and, fearing the worst, launch its own nuclear weapons rather than lose them to an enemy’s first strike. This makes the scenario proffered in the 2018 NPR report, of a nuclear response to an enemy cyberattack, that much more alarming.

### 1AC---Solvency

#### Plan: The United States federal judiciary should substantially increase prohibitions on private sector conduct that is more restrictive of competition than reasonably necessary to enable creation of information technology standards.

#### The plan requires SSO’s to administer reasonable action to prohibit ex post opportunism---that strengthens FRAND effectiveness while enabling SEP holders to capture appropriate royalties---which is the best competition-innovation balance.

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)

3. Application of the Basic Legal Principles

The antitrust principle is straightforward: industry-wide collaboration through SSOs to establish procompetitive standards is permitted only if it is no more restrictive of competition than reasonably necessary to enable creation of the standards. When standard setting predictably creates technology monopolies that, if unrestrained, will enable anticompetitive ex post opportunism that would otherwise not occur, an SSO that does not take effective measures to prevent or minimize such ex post opportunism engages in conduct that is more restrictive of competition than necessary. In that case, the SSO and, in appropriate cases, its members, may well violate Section 1 of the Sherman Act.

Under this principle, SSO procedures and FRAND rules should be evaluated based on whether they lead to reasonable SEP royalties, using the competitive ex ante licensing standard discussed above, which has been adopted by the courts in patent law. Put differently, FRAND rules should be evaluated based on their ability to prevent SEP holders from obtaining more than the ex ante value of their technology from implementers.

This limitation would not prevent a SEP holder from proﬁting, perhaps greatly, from participating in the SSO and having its patented technology included in the standard. The SEP holder continues to be rewarded for its technology because the inclusion of its technology in the standard can still greatly increase the volume of licensing opportunities available to the SEP holder.

Whether a particular set of FRAND rules are sufficiently effective in preventing ex post opportunism will depend on the particular circumstances. The procedural unfolding of the case will also depend upon the circumstances. As a general matter, the case would probably be structured as an ordinary Rule of Reason case.82

First, the plaintiff would have to demonstrate harm to competition as a result of the collaboration of the SSO’s members, many of which compete with one another. In this case, the harm to competition would stem from the ability of the SEP holder to exercise monopoly power by obtaining royalties in excess of the competitive, ex ante level. The decision to include patented technologies in the standard would be the allegedly unlawful agreement. Notably, the court need not determine what a FRAND royalty is; it would suffice to determine that market power has been created or exercised, and that existing SSO rules and policies were not adequate to prevent the competitive harm. The defendant, which could be the SSO or perhaps one or more SSO members, would win at this point if the plaintiff failed to show harm to competition. If might fail if the standard faces substantial competition and the court concludes that the SEP holder therefore does not have market power or if the SSO’s rules and policies are found to be effective in preventing ex post opportunism, even if the plaintiff or even the court thinks that other rules and policies would be preferable.

Second, if the plaintiff makes the requisite showing of harm to competition, the defendant(s) would then have to show some procompetitive justiﬁcation— in this case, the beneﬁts of the standard. These two initial steps should be straightforward.

Third, if as is likely the defendant is able to show a procompetitive justiﬁcation, the plaintiff would have to show that the SSO could have used available, reasonable alternatives to realize the efficiency beneﬁts with less or none of the competitive harms. The plaintiff might identify reasonable alternatives that would have led to a different standard, based on including unpatented technology in the standard or perhaps involving fewer SEPs or fewer owners of SEPs, which would be less subject to patent holdup. More likely, the plaintiff could suggest alternative SSO rules that would not change the standard, but would reduce the likelihood or extent of ex post opportunism. For example, the plaintiff might suggest more rigorous FRAND-type rules, such as rules that set forth more precise principles on which FRAND royalties are to be determined and the circumstances under which SEP holders might seek injunctions.

Fourth, the burden would then shift to the defendant(s) to show that the beneﬁts of the standard could not have been realized if the SSO had adopted any of the proffered alternatives or that those alternatives were unrealistic.83 The plaintiff would be entitled to judgment if the court concludes that those beneﬁts could have been realized with less competitive harm if the SSO had adopted the standard with different IPR rules or policies.

Our overall sense, based on experience and the empirical literature, is that the extant FRAND rules are generally useful, but tend to be inadequate because they are imprecise and leave unresolved such critical issues as (a) the meaning of a reasonable royalty, even conceptually; (b) the meaning of “non-discriminatory;” (c) to whom licenses must be offered; and (d) under what circumstances may a SEP holder obtain an injunction.84 These imprecise FRAND commitments are therefore not sufficient to adequately prevent ex post opportunism. The recent revisions to IEEE’s FRAND policy represent a signiﬁcant step in the right direction, but even this advance leaves important questions unanswered.85 If FRAND rules are inadequate in these ways, litigation involving extant FRAND rules would likely be resolved only at the ﬁnal, fourth step. The defendant would be able to demonstrate the beneﬁts created by the standard; the plaintiff would be able to demonstrate the creation of market power and that other reasonable and practical rules or policies would ameliorate the problem. The case would thus turn on whether the defendant is able to demonstrate that signiﬁcant beneﬁts associated with standardization could not have been realized if the SSO had adopted those other rules or policies.

The court would have available a variety of possible remedies if the plaintiff prevails. Implementers that paid supracompetitive royalties or were unlawfully excluded in whole or in part from product markets as a result of the inadequate FRAND policies would be entitled to damages and, in some cases, to treble damages.86 If the unlawful SSO conduct is regarded as the collective action of the SSO and its members, which is likely to be the case in most instances, SSO members would be jointly and severally liable for the damages. Forward-looking injunctive relief aimed at restoring competition would need to be fashioned to the requirements of the individual case. For example, a court could order the SSO to adopt a new rule or policy proposed by the plaintiff. If the court is reluctant to take on that governance role, it might give the SSO a period of time—maybe ninety days—to develop a rule, subject to the court’s ultimate approval, which would adequately ameliorate the competitive problem created by the SSO. Alternatively or in addition, the court might order the parties to attempt to negotiate a rule or policy on which they can agree. And, depending on the circumstances, the court might order SEP holders, including at least those that were defendants in the case, to comply with the new SSO rules and policies.

#### Alleviating patent holdup begins by permitting consumer challenges to SSO misconduct, which necessitates antitrust. SSO’s cannot be counted on to self execute FRAND.

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.

The problem is exacerbated by the fact that most SSOs put IPR rules in place long ago, when SEP-holder opportunism was much less of a problem. Proponents of new, stricter IPR rules to prevent SEP-holder opportunism thus face the daunting task of persuading an SSO that makes decisions by consensus to change an existing policy over the often-intense opposition of SEP holders. The dispute over the recent changes to the IPR rules at the Institute of Electrical and Electronics Engineers (IEEE) illustrates how difficult and contentious that process can be.81

Thus, effective prevention of ex post opportunism by SEP holders requires antitrust enforcement to overcome the SSO problems associated with (a) attenuated incentives (implementers that also own SEPs); (b) the public good aspect of stronger FRAND rules (the danger that implementers will free ride on others rather than expend resources to implement strong FRAND rules); and (c) externalities (the harm to consumers that results when implementers pass through higher royalties in the form of higher prices).

#### Indicting systemic holdup is a fruitless academic exercise. Be cautious of neg studies---they rely on deeply flawed methodologies, don’t address relevant hypotheses, and in all likelihood are funded by Qualcomm.

Shapiro & Lemley 20, \*Carl Shapiro is the Transamerica Professor of Business Strategy Emeritus at the Haas School of Business, University of California at Berkeley; \*Lemley is the William H. Neukom Professor at Stanford Law School and a partner at Durie Tangri LLP; (2020, “THE ROLE OF ANTITRUST IN PREVENTING PATENT HOLDUP”, https://faculty.haas.berkeley.edu/shapiro/patentholdup.pdf)

C. Actual Patent Holdups Are Very Difficult to Measure

As with holdup in general, quantifying the frequency and magnitude of actual patent holdups is very difficult as a practical matter and not a useful way of assessing the importance of the patent holdup problem. Rarely can researchers observe the ex post price, because patent licensing terms are normally confidential. Even when researchers can observe the license fees, they are often embedded in a complex agreement. And even in those rare cases where researchers can accurately observe the ex post price, they are unlikely to observe the ex ante price, making it difficult if not impossible to measure the magnitude of the holdup.

Litigated cases also are problematic as a source of data to quantify the magnitude of actual patent holdups. A litigated case resulting in an award of reasonable royalties may well involve attempted holdup, but by definition it cannot provide smoking-gun evidence of actual holdup, at least if one accepts that the royalties awarded by the court are reasonable.64 Rather, at least since the Supreme Court eliminated the automatic entitlement to an injunction, litigation to judgment (which is rare) often reflects a refusal to give in to holdup by a defendant willing to take its chances in court. And the vast majority of patent cases settle. The terms of a settlement are rarely observable, so it is impossible to know whether those settlements reflected the value of holdup.

Notwithstanding these points, a number of authors have pointed to a lack of empirical evidence to argue that patent holdup either does not exist or is not a significant problem.65 Even taken on their own terms, many of these papers are deeply flawed. One such paper, which has often been cited by those who downplay the importance of patent holdup, purports to offer empirical evidence inconsistent with the hypothesis that SEP holdup has slowed innovation or harmed consumers.66 The conclusion to this Qualcomm-funded paper states, “[w]e cannot reject the hypothesis of no SEP holdup.”67 How do these authors reach this conclusion? They compare rates of change of quality-adjusted prices in “SEP- reliant” industries with “similar” non-SEP-reliant industries, primarily over the 1997-2013 period.68 For example, they show that quality-adjusted prices of cellular phones have fallen faster than the quality-adjusted prices of automobiles.69 This exercise does not address the relevant hypothesis: whether SEP holdup increased the price of cellular phones from what it otherwise would have been.70 The quality- adjusted prices of pharmaceuticals have risen much faster than automobiles over the same period of time, but that similarly is not proof that pharmaceuticals are subject to a patent holdup problem.

Beyond the obvious and fatal flaws in this empirical work,71 the whole line of inquiry is of limited relevance for the purpose of measuring the social costs of holdup or designing institutions to limit patent holdup, because it only looks for instances of actual patent holdup. As explained above, these instances are very difficult to detect and are only the tip of the iceberg in terms of the social costs of patent holdup.72 So far as we can tell, the vast majority of these papers have been funded by Qualcomm and other patent holders seeking to weaken the institutions designed to control patent holdup, increase their leverage in licensing negotiations, and thus increase their ability to monetize their patents.73

Despite the difficulties of observing the incidence and magnitude of actual patent holdups, we are able to observe the telltale signs of actual patent holdup. Transaction cost economics, and simple bargaining theory for that matter, tell us that actual patent holdup can be expected to occur when three conditions are present: (1) a firm has developed a new product independently; (2) that firm has made significant investments that are specific to one or more patents asserted against that product; and (3) the firm is not protected from patent holdup.74 As discussed above, conditions (1) and (2) are common in the high-tech sector, placing considerable weight on the institutions that protect firms from patent holdup.

The presence of those institutions is itself evidence that the patent holdup problem is real and significant. As we noted in Part I, companies try to structure their transactions to avoid holdup, developing institutions for that purpose. As we have seen, the traditional market solutions do not work well for patents. In most industries, the central mechanisms limiting patent holdup come from patent law, namely the rules governing injunctions and patent damages. In the high-tech sector, companies have overwhelmingly turned to SSOs in an effort to obtain global commitments to an ex ante royalty, which appear in the form of FRAND commitments. The near-universal recognition in the industry of the need for such a mechanism is strong evidence that companies view holdup as a problem they must build institutions to avoid.

# 2AC

## ADVANTAGE---INNOVATION

### 2AC---DPT True

#### DPT’s true---there’s a clear dyadic peace and a lower risk of war across the board.

Hegre et al. 18 (Havard; Professor Department of Peace and Conflict Research Uppsala University; Michael Bernhard; Miriam Ehrlich Chair in Political Science Department of Political Science University of Florida; Jan Teorell; Professor of Political Science Department of Political Science Lund University; *Reassessing the Democratic Peace: A Novel Test Based on the Varieties of Democracy Data*; <https://gupea.ub.gu.se/bitstream/2077/56045/1/gupea_2077_56045_1.pdf>)

4. Results

We estimated two sets of models for all pairs of states for every year over the 1900–2010 period with the democratic peace hypothesis represented as the democracy score(s) of the stronger country, that of the weaker country, the interaction of these two, and several control variables. In the first set of models, we entered the five indicators of constraint one by one along with our control variables. Figure 3 summarizes the results from these models. Complete estimation results in table form with all control variables are found in Appendix Table A-1.

The first model (called ‘Electoral accountability’) enters the three terms based on the electoral accountability index along with control variables. The estimates from this model are printed in green color at the top of the figure. The points represent the estimates and the whiskers their estimated 95% confidence interval. The two main terms are both positive, although that for the weaker country is not statistically significant. The interaction between the index values for the two countries in the dyad, on the other hand, is negative and highly significant – when both countries score highly in terms of electoral accountability, the risk of fatal dispute is much lower than if either have low scores. In line with expectations, we show in Appendix Table A-3 that the effect of electoral democracy is driven by the “Schumpeterian” core dimensions tapping into contestation – whereas suffrage does not play an independent role in promoting peace.

The second model enters the ‘Legislative constraints’ index terms. Again, the interaction term is negative and significant, whereas the main terms are positive and significant. Similar patterns are observed for the other three individual indicators.

Figure 4 shows that the net effect for each of these indicators is consistent with the democratic peace. In the left panels, the dashed line plots the estimated log odds of a MID when the weaker country j is at the mean of the index, as a function of the score for the stronger country (along the x-axis). The metric for the y-axis is log odds relative to the case where both countries have scores of 0 for the index. The dotted and solid lines show the same when the index is one standard deviation below or above the mean.19

The graph on the right plots the marginal effect of this relationship – it shows the change in the estimated probability of a fatal dispute when comparing a pair of countries where the weaker country has a value for the index one standard deviation below the mean and one standard 22 deviation above, respectively, as a function of the index for the stronger country. Both these graphs show a clear dyadic democratic peace in terms of all our indices of constraint – a more democratic weaker country means a clearly lower risk of fatal MID if the stronger country is relatively democratic.20

All of our individual indicators of constraint reflect the democratic peace when entered on their own. Given the high correlation between them, however, each of them may serve as a proxy for one of the other. We investigate which of them are relatively most important along two routes.

### 2AC---AT: No Patent Holdup---Not Systemic

#### There’s no impact to winning this argument.

Cotter et al. 19, \*Thomas F. Cotter, Briggs and Morgan Professor of Law, University of Minnesota Law School; Innovators Network Foundation Intellectual Property Fellow; \*Erik Hovenkamp, Assistant Professor, USC Gould School of Law; \*Norman Siebrasse, Professor of Law, University of New Brunswick Faculty of Law; (2019, “Demystifying Patent Holdup”, https://scholarlycommons.law.wlu.edu/cgi/viewcontent.cgi?article=4667&context=wlulr)

B. Patent Holdup Is Not a Problem, Because It Is Not Systemic

A second, related argument is that there is no empirical evidence of patent owners engaging in pervasive, systemic patent holdup in the very industries holdup theorists are most concerned with (e.g., telecommunications).139 Indeed, according to the critics, if holdup were pervasive one would expect innovation and growth in the affected industries to “stagnate, wither, or die,”140 whereas if one looks “across human history, it is not clear that the commercialization of complex technologies has ever been faster than it is today in those industries that reform proponents point to as most plagued by the patent holdup ‘problem.’”141

Although we agree that whether, or to what extent, patent holdup occurs in the real world is ultimately an empirical matter, the implication that patent holdup is a problem only if it is “pervasive” or “systemic” is a non sequitur.142 If our analysis above is correct—that the ability to engage in patent holdup depends on path dependence, that settings conducive to patent holdup are not uncommon, and that the three components of a holdup royalty can exist independently of one another—patent holdup does not have to be systemic to be capable of reducing social welfare. Seeing how the empirical critiques of patent holdup do “not claim[ ] that individual firms never attempt to engage in behavior that can be characterized as holdup,”143 the conclusion that holdup is not systemic may well be accurate, for all we know, while still being of any limited relevance for purposes of determining whether injunctive relief should issue on the facts of any one particular case.144 If the choice were between always granting an injunction without tailoring or conditions, and never granting any form of injunctive relief, perhaps the question of whether holdup was systemic, at least in a particular industry, would be central. But the traditional approach to injunctive relief looks to the facts of the particular case.145

#### Patent holdup is real and necessitates intervention, even if it can’t be systemically proven.

Contreras 19, \*Jorge Contreras, Professor, University of Utah S.J. Quinney College of Law; (2019, “MUCH ADO ABOUT HOLD-UP”, <https://www.illinoislawreview.org/wp-content/uploads/2019/08/Contreras.pdf>)

B. Protective Measures May Already Be Working to Reduce Hold-Up

Another important factor that should be considered regarding the purported lack of empirical evidence of systemic hold-up is the effect that existing policy measures have already had in reducing hold-up. As noted above, the threat of patent hold-up was a primary motivating factor for many SDOs to adopt policies requiring the disclosure and licensing of SEPs. These policies have been in place for decades. In the United States, the first such policy was adopted in 1959 by the American Standards Association (the predecessor to today’s American National Standards Institute (ANSI).102 Today, every one of the more than 200 ANSI-accredited developers of American National Standards must adhere to ANSI’s essential requirements, including the adoption of such a licensing policy for SEPs. Similar policies have existed in European and international standards organizations since at least the 1980s.103 These policies, which were developed by SDOs in large part to reduce the likelihood of hold-up within standard-setting systems, have had several decades to work, and it is likely that the lack of observed hold-up in some studies can be attributed to the successful operation of these policies.

Similarly, antitrust and competition enforcement agencies in the U.S. and Europe have been aware of the potential for hold-up connected with standardization for many years. Accordingly, they have brought enforcement actions when it has been alleged that hold-up behavior has resulted in a violation of the antitrust laws. High-profile enforcement actions against patent holders such as Rambus, 104 Google 105 and Qualcomm106 send powerful deterrent signals to the market and warn others not to engage in similar behavior lest they, too, become the subject of agency enforcement. Like SDO policies, it is likely that the general market awareness of agency interest in standard-setting and hold-up has, to a degree, limited the amount of hold-up that is actually attempted in the marketplace, thereby limiting the direct evidence of hold-up as a systemic problem.

But do the deterrent effects of SDO and agency efforts to reduce hold-up signify that hold-up is not a problem? Certainly not. To reach such a conclusion would be perverse: akin to claiming that burglary is not a problem in a neighborhood that experiences reduced burglary rates after it has implemented an active neighborhood watch program and enhanced policing.

C. Indicia of Healthy Markets do not Prove the Absence of Anticompetitive Conduct

As noted above, one of the principal arguments advanced by commentators seeking to refute the “hold-up theory” is that markets for telecommunications products, namely smart phones, are robust – evidenced by increasing product functionality, decreasing consumer prices and rapid innovation -- and that this degree of robustness indicates that hold-up cannot be a problem in these markets.107 If hold-up were a problem in these markets, they reason, we would see product stagnation, stable (but high) prices, and a lack of competition – features associated with classic examples of hold-up in markets for products such as natural resources and agricultural goods.108

But this argument relies on a false syllogism: hold-up results in market dysfunction; if a market functions well, then it cannot be subject to hold-up. The weaknesses in this argument are multifold. First, hold-up may exist in individual instances without sufficient weight to affect overall market characteristics, particularly in a large global market such as mobile telecommunications. Thus hold-up may exist, even in a market that outwardly appears to be functioning well. Second, there is no valid counterfactual to use to compare the health and robustness of the market for mobile telecommunications products.109 Other consumer electronics devices, such as televisions and DVD players, do not compare well with mobile telecommunications devices, which have taken on a unique character in the modern networked economy. Thus, observing the strength of the market fails to answer the critical questions “compared to what?” and how much stronger the market might be (through more product diversity, functionality, price reduction) without hold-up?

A simple historical illustration is useful in this context. During the decade leading up to the enactment of the Sherman Antitrust Act of 1890, several major U.S. commodity markets (e.g., steel, salt, petroleum, coal, sugar, lead, and others) came under intense scrutiny for a variety of allegedly anticompetitive industrial arrangements. One might have argued that these markets, had they been subject to the sorts of anticompetitive collusion that the Sherman Act sought to address, should have seen reductions of output and increases in price. Yet, between 1880 and 1890, U.S. output of salt, petroleum, steel, and coal all increased significantly, and prices of steel, sugar and lead all dropped significantly.110 Do these positive market indicia demonstrate that the subject markets were not subject to anticompetitive collusion, and that the Sherman Act was not necessary? Certainly, investigations of these industries revealed significant cartel behavior. I would suggest that few commentators today would argue that the coal, steel, sugar and other major industrial producers of the late nineteenth century were innocent of collusive and anticompetitive conduct, or that the Sherman Act was not a necessary and beneficial measure for the U.S. economy.111 Yet, had we relied solely on the positive characteristics exhibited by these markets as proof that anticompetitive conduct did not exist, then perhaps the Sherman Act never would have been enacted.

By the same token, the fact that global markets for standardized products such as computers and smart phones appear to be thriving does not itself refute the possibility of hold-up nor the existence of anticompetitive conduct in these markets. Nor does it allow regulators and policy makers to drop their guard or cease to monitor these important industries.

### 2AC---Indict---GMU

#### Don’t trust authors from GMU’s Mercatus Institute (or Global Antitrust Institute)---Abbott, Barnett, and Wright.

McLaughlin 21, Bloomberg, (David, March 12th, 2021, “One Tech-Funded University Helped Shape FTC’s Hands-Off Approach”, <https://www.bloomberg.com/news/articles/2021-03-12/how-george-mason-university-shaped-ftc-s-hands-off-approach-to-tech>)

* Alden Abbott, Jonathan Barnett are both fellows at George Mason University’s Center for Intellectual Property and Innovation Policy (funded by Qualcomm)
* Joshua Wright is a former FTC commissioner who taught at the institute and lobbied for Qualcomm

The [Tech Transparency Project](https://www.techtransparencyproject.org/) (TTP), a watchdog group in Washington, details in a new report an unusually close relationship between the law school at Virginia’s George Mason University and the Federal Trade Commission. By helping shape the workforce of the FTC, the group claims, the school infused it with a laissez-faire philosophy favorable to the school’s tech donors.

[The report](https://www.techtransparencyproject.org/articles/big-techs-backdoor-ftc) throws a harsh light on the FTC’s hands-off approach to tech companies over the past decade. As the agency prepares to argue the lawsuit against [Facebook Inc.](https://www.bloomberg.com/quote/FB:US) that it filed late last year, seeking to break up the social media giant, it must contend with an inconvenient fact: It approved Facebook’s acquisitions of Instagram in 2012 and WhatsApp in 2014—the very mergers it now seeks to undo. The FTC’s consent to those deals is cited by critics as evidence of a permissive attitude that allowed tech companies to grow into leviathans.

One explanation for its lenience, the TTP report charges, is that the industry used a corner of academia to capture the agency. According to the report, which was published on March 12, Silicon Valley donated substantial sums to George Mason’s Antonin Scalia Law School, which built a pipeline of professors and graduates who went to work at the FTC. Dozens of people went from the school to the regulator—commissioners, bureau heads, attorney-advisers, legal interns—during the Obama and Trump administrations.

Under President Trump alone, professors and graduates of Scalia Law, and heads of affiliated programs at George Mason, served as the FTC chair, general counsel, policy planning head, and leaders of its three main divisions: the bureaus of competition, consumer protection, and economics.

Katie Paul, who heads the TTP, says an investigation is needed into “whether George Mason University has effectively become Big Tech’s back door into the FTC, giving the companies an undisclosed way to sway its decision-making and hobble enforcement action.”

Revolving Door

Large tech companies have donated to two programs affiliated with Scalia Law, the Global Antitrust Institute and the Law & Economics Center. From January 2018 to the end of last year, [Google](https://www.bloomberg.com/quote/GOOGL:US) donated $900,000, [Amazon.com Inc.](https://www.bloomberg.com/quote/AMZN:US) contributed $925,000, and Facebook Inc. gave $675,000, according to documents obtained by Bloomberg Businessweek through a public records request. Google, Amazon, and Facebook declined to comment on their donations.

The law school says the ties between its faculty and the FTC aren’t unusual. Alison Price, a senior associate dean, says it’s common for professors to work for federal agencies and then return to their teaching jobs. “Since Scalia Law has special expertise and a relatively large faculty in antitrust, it’s logical that our faculty is called to serve with frequency,” she says. “But faculty don’t set policy; administrations do.”

The Tech Transparency Project is part of a larger watchdog group, [Campaign for Accountability](https://campaignforaccountability.org/). The TTP website cites several philanthropists as donors, including George Soros’s Open Society Foundations. Oracle Corp. had been a donor to a TTP predecessor group that focused mostly on Google, but the TTP says it no longer accepts corporate funding.

Both George Mason programs, which host conferences and offer training for judges and antitrust enforcers, promote the consumer-welfare standard articulated by Robert Bork, the late federal judge and Yale Law School professor. That standard, the guidepost for regulators and courts since the 1980s, looks to price increases as a gauge of competitive harm. It is blamed by some antitrust experts for handcuffing enforcers when it comes to policing tech companies.

The tech companies’ donations are drawing scrutiny. At a hearing on Feb. 25, New York Democratic Representative Mondaire Jones called Abbott “Tad” Lipsky, a former FTC official now at the [Global Antitrust Institute](https://gai.gmu.edu/), “a wolf in sheep’s clothing.” As he testified against proposals to give the antitrust laws more teeth, Lipsky drew Jones’s scorn. Programs such as the GAI “have worked to teach judges and regulators to let their guard down as corporate funders like yours came to dominate our economy,” Jones said. Lipsky responded that his antitrust views predated “any of these digital technology companies.”

A key figure in the law school-to-regulator pipeline is Lipsky’s boss, Joshua Wright, an FTC commissioner from 2013 to 2015. He now teaches antitrust law at George Mason while also running the GAI.

Wright wielded outsize influence at the agency, pushing through a 2015 policy statement in an attempt to rein in the agency’s enforcement power. After he left he improperly lobbied the agency on behalf of Qualcomm Inc., one of the law school’s largest donors, according to a report by the FTC inspector general that was obtained by TTP and verified by Bloomberg Businessweek. His name was redacted in the report, but Wright confirmed it was about him. He says he did nothing wrong.

The New York Times last year [reported that tech companies bankrolled the work of the GAI](https://www.nytimes.com/2020/07/24/technology/global-antitrust-institute-google-amazon-qualcomm.html) and that Wright had worked with corporate donors to fend off critics. The extent of the revolving door between the FTC and the law school, and Wright’s alleged violation of ethics laws, haven’t been previously reported.

Many companies support higher education, and many universities send professors and graduates to Washington. But George Mason is unique in cultivating a specific regulator, says Jeff Hauser, executive director of the [Revolving Door Project](https://therevolvingdoorproject.org/), which tracks government officials’ corporate ties.

“In terms of feeding directly into a government agency, I’m not aware of any equivalent at the SEC or the EPA or anything else,” he says, referring to the Securities and Exchange Commission and the Environmental Protection Agency.

A public university in the northern Virginia suburbs of Washington, George Mason is home to the free-market think tank the [Mercatus Center](https://www.mercatus.org/). It is a leader in the study of applying economic analysis to the law, emphasizing that markets work best when government regulates less. The university became known as a haven for conservatives at the end of the Reagan administration in 1988. Even Bork taught there after stepping down from the bench in 1988.

The George Mason conduit was steady and robust, according to the TTP, which details dozens of examples of people moving between the FTC and the law school over the past decade. One is James Cooper, who directs an economics and privacy program at the Law & Economics Center. He simultaneously taught at the school and served as a deputy director for the FTC’s Bureau of Consumer Protection.

Cooper was among the academics who urged House lawmakers last year to reject proposals to break up tech companies and make merger approvals more difficult. George Mason’s Wright, Lipsky, and John Yun, a professor at the law school who was an economist at the FTC, joined the filing. Cooper didn’t respond to a request for comment, and Yun declined to comment.

But Wright, the former FTC commissioner, perhaps best embodies the ties linking the FTC to the law school and its donors. After leaving the agency in 2015, Wright simultaneously taught at George Mason, ran the GAI, and worked for the Wilson Sonsini Goodrich & Rosati law firm, where he represented Qualcomm.

The FTC sued Qualcomm in January 2017 in a monopoly case that was developed while Wright was an FTC commissioner. Wright tried to broker a settlement about four months after the case was brought. He met Lipsky, then the acting director of the FTC’s competition bureau, for lunch at a steakhouse in Washington and tried to set up an additional meeting with agency officials, according to the inspector general’s report.

In doing so, Wright violated an ethics law that bans officials for life from lobbying on issues they worked on “personally and substantially,” according to the inspector general. Those findings were referred to the Department of Justice’s public integrity section. The Justice Department, which decided not to prosecute, declined to comment.

Lipsky resigned two months after his lunch with Wright, who then hired him at the GAI. Lipsky didn’t respond to a request for comment.

“I never made any appearance at the FTC involving its enforcement action against Qualcomm or discussed the merits of the case with any FTC official,” says Wright, who declined to elaborate on the specifics of the investigation. “I immediately complied when the FTC ethics office informed me that I should not make any appearance based upon a single preliminary vote I had cast years before the case was filed.”

Qualcomm contributed almost $5.8 million to the George Mason law school programs from 2016 through 2020. Less than two months before Wright met with the FTC to try to settle the Qualcomm case, the company gave $525,000 to the GAI. The company didn’t respond to requests for comment.

Tech companies that donate to George Mason collaborate with the school’s professors on projects, according to emails obtained through a public records request.

## ADVANTAGE---CYBER

## AT: T---PER SE

### 2AC---AT: T---Prohibit = Per Se---TL

#### Counter-interpretation---rule of reason is a prohibition.

Light 19, Sarah E. Light Assistant Professor of Legal Studies and Business Ethics, The Wharton School, University of Pennsylvania., The Law of the Corporation as Environmental Law, 71 Stan. L. Rev. 137, 2019, Lexis/Nexis

While antitrust law can serve as an environmental mandate by prohibiting collusive behavior that keeps environmentally preferable goods from the market, there is also conflict between antitrust law's goals of promoting competition and environmental law's goals of promoting [\*177] conservation. 192 Because antitrust law's per se rule and rule of reason operate on a somewhat fluid continuum, 193 this Subpart discusses the two doctrines together. The per se rule operates as a prohibition, whereas the rule of reason operates as both a prohibition and a disincentive. As noted above, antitrust law generally prohibits certain types of market activity - price fixing, horizontal boycotts, and output limitations - as illegal per se, and harm to competition is presumed. 194 For example, if an industry association declines to award a seal of approval necessary for a product's sale without any good faith attempt to test the product's performance, but rather simply because that product is manufactured by a competitor, such an action would be illegal per se. 195 Under this Article's framework, a per se violation is thus a prohibition. The more fact-intensive inquiry under the rule of reason tests "whether the restraint imposed is such as merely regulates and perhaps thereby promotes competition or whether it is such as may suppress or even destroy competition." 196 While this extremely broad statement might suggest that any fact is relevant to the inquiry, the salient facts under the rule of reason are "those that tend to establish whether a restraint increases or decreases output, or decreases or increases prices." 197 If an anticompetitive effect is found, then the action is illegal and the rule of reason operates, like the per se rule, as a prohibition. 198 The rule of reason can also operate as a disincentive, even if no [\*178] court finds an anticompetitive effect, as uncertainty and litigation risk may discourage firms from undertaking legally permissible, environmentally positive industry collaborations. 199 Associations of firms have adopted numerous mechanisms of private environmental governance to address the management of common pool resources like fisheries, forests, and the global climate. 200 Examples include the Sustainable Apparel Coalition's Higg Index 201 and the American Chemistry Council's Responsible Care program. 202 But private industry standards raise special antitrust concerns. An agreement among competitors with respect to product or process specifications may exclude competitors who fail to meet such standards, raising the specter that such industry collaborations really constitute output limitations or efforts to limit competition. 203 While the U.S. Supreme Court has scrutinized private standard-setting associations carefully, 204 it has noted that if associations "promulgate … standards based on the merits of objective expert judgments and through procedures that prevent the standard-setting process from being biased by members with economic interests in stifling product competition … , those private standards can have significant procompetitive advantages." 205 In the absence of price fixing or a boycott, a rule of reason analysis generally applies to product standard setting by private associations. 206 The uncertain outcome [\*179] inherent in the application of antitrust law in this context could therefore serve as a potential disincentive to the adoption of private industry standards. 207 The challenge of course is that some form of explicit sanctions on noncompliant industry members may be necessary for private industry standards to be effective. In the context of private reputational mechanisms like the New York Diamond Dealers Club, 208 Barak Richman has pointed out that the Club's use of reputational sanctions and voluntary refusals to deal with actors who flout industry norms, while welfare enhancing, could nonetheless amount to violations of antitrust law. 209 This echoes the concern raised by Andrew King and Michael Lenox in their extensive empirical analysis of the Responsible Care program created by the Chemical Manufacturers Association (now the American Chemistry Council). 210 King and Lenox concluded that the absence of explicit sanctions on members who failed to meet the standards set by the program left the program vulnerable to "opportunism." 211 While they suggested that industry associations could look to third parties to enforce the rules, 212 an alternative way to facilitate the long-term environmental benefits of stronger sanctions would be to interpret antitrust law in conformity with the environmental priority principle presented below. 213 [\*180] In some instances, the conflict between the values of promoting competition and conserving environmental resources can be stark. 214 Jonathan Adler, for example, has identified this conflict in the context of fisheries - a tragedy of the commons situation in which some form of collective action is required to avoid overfishing. 215 He cites as an example Manaka v. Monterey Sardine Industries, Inc., in which a fisherman was excluded from a local fishing cooperative. 216 The fisherman sued the cooperative under the Sherman Act, and the court found an antitrust violation in his exclusion. 217 While the fishing cooperative's policies were no doubt exclusionary, Adler contends that they also promoted conservation by restricting catch. 218 The fishery collapsed by the 1950s, a collapse Adler hypothesizes might have been "inevitable" but that perhaps might not have occurred in the absence of the antitrust suit. 219 While a court performing a rule of reason analysis must consider whether a restraint on trade suppresses or destroys competition, Adler points out that courts may also "consider offsetting efficiencies from otherwise anticompetitive arrangements." 220 It is not clear, however, that the courts have consistently taken these factors into account. 221 Among other potential remedies, Adler argues that to resolve this tension between antitrust law, on the one hand, and private collective action to conserve environmental resources, on the other, courts should more actively consider the "ancillary conservation benefits of otherwise anticompetitive conduct." 222 Recognizing the long-term health of a fishery would be consistent with antitrust law's purpose of ensuring viable markets exist in the future, and consistent with the environmental priority principle introduced below. 223

#### Prohibit can mean ‘severely hinder’---doesn’t necessitate a ban.

Washington Court of Appeals 19 (KORSMO-judge. Opinion in State v. Kimball, No. 35441-5-III (Wash. Ct. App. Apr. 2, 2019). Google scholar caselaw. Date accessed 7/13/21).

His argument runs counter to the meaning of the word "prohibit." It means "1. To forbid by law. 2. To prevent, preclude, or severely hinder." BLACK'S LAW DICTIONARY 1405 (10th ed. 2014). As "severely hinder" suggests, a "prohibition" need not be an all or nothing proposition.

## AT: T---PRIVATE SECTOR

### 2AC---AT: T---Private Sector = All---TL

#### Counter-interpretation---the private sector includes an industry.

The Law Dictionary N.D., (The Law Dictionary: Featuring Black's Law Dictionary Free Online Legal Dictionary 2nd Ed. “Private Sector” , <https://thelawdictionary.org/private-sector/> , date accessed 9/11/21)

What is PRIVATE SECTOR?

An industry that is composed of private companies. The corporate sector and the personal sector are encompassed in the private sector and they are responsible for the allocation of the majority of resources within the economy.

#### The private sector includes subsets---refers to many different actors.

Waler and Hofstetter 16 (Katharina Walker is Advisor for vocational skills development and Helvetas’ youth focal person. Sonja Hofstetter joined Swisscontact in Cambodia in July 2016. She is the Quality Assurance Manager and Deputy Team Leader of the Skills Development Programme. “ Study on Agricultural Technical and Vocational Education and Training (ATVET) in Developing Countries” Federal Department of Foreign Affairs FDFA, Swiss Agency for Development and Cooperation SDC, Global Programme Food Security, 25.1.2016, <https://www.shareweb.ch/site/Agriculture-and-Food-Security/focusareas/Documents/ras_capex_ATVET_Study_2016.pdf> , date accessed 7/19/21)

In many developing countries, the private sector1 [[BEGIN FOOTNOTE 1]] 1 The private sector is not perceived as a homogenous mass even though the terminology might suggest this to be the case. In this study, the term “private sector” is used to circumscribe the various actors such as small and medium sized companies, large companies, sectorial associations, business associations, chambers of commerce, etc.[[END FOOTNOTE 1]] faces challenges in finding adequately skilled employees. This also holds true for sectors linked to agriculture, e.g. processing, distribution, marketing, etc. The development of ATVET from a purely productivity-oriented approach to provide broader and more specialised skills sets along agricultural value chains is likely to raise the interest of private sector actors. This incentive can result in a stronger and more sustainable financial and conceptual engagement of employers in ATVET.

## AT: K---CAP

### 2AC---K---Cap

#### 2---warming---a plethora of indicators demonstrate that catastrophic climate change can be averted. The momentum exists but capitalizing on it is key.

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The change is much bigger than the turnover of American leadership. By the time the Biden presidency finds its footing in a vaccinated world, the bounds of climate possibility will have been remade. Just a half-decade ago, it was widely believed that a “business as usual” emissions path would bring the planet four or five degrees of warming — enough to make large parts of Earth effectively uninhabitable. Now, thanks to the rapid death of coal, the revolution in the price of renewable energy, and a global climate politics forged by a generational awakening, the [expectation](https://climateactiontracker.org/global/temperatures/) is for about three degrees. Recent pledges [could bring us closer to two](https://climateactiontracker.org/publications/global-update-paris-agreement-turning-point/). All of these projections sketch a hazardous and unequal future, and all are clouded with uncertainties — about the climate system, about technology, about the dexterity and intensity of human response, about how inequitably the most punishing impacts will be distributed. Yet if each half-degree of warming marks an entirely different level of suffering, we appear to have shaved a few of them off our likeliest end stage in not much time at all.

The next half-degrees will be harder to shave off, and the most crucial increment — getting from two degrees to 1.5 — perhaps impossible, dashing the dream of avoiding what was long described as “catastrophic” change. But for a climate alarmist like me, seeing clearly the state of the planet’s future now requires a conspicuous kind of double vision, in which a guarded optimism seems perhaps as reasonable as panic. Given how long we’ve waited to move, what counts now as a best-case outcome remains grim. It also appears, miraculously, within reach.

In December, a month after Biden was elected promising to return the U.S. to the Paris agreement, the U.N. celebrated five years since the signing of those accords. They were five of the six hottest on record. (The sixth was 2015, the year the agreement was signed.) They were also the years with the highest levels of carbon output in the history of humanity — with emissions equivalent to what was produced by all human and industrial activity from the speciation of Homo sapiens to the start of World War II.

They have also been the five years in which the nations of the world — and cities and regions, individuals and institutions, corporations and central banks — have made the most ambitious pledges of future climate action. Most of them were made in the past 12 months, in the face of the pandemic. Or, perhaps, to some degree, because of it — because the pandemic demanded a full-body jolt to the global political economy, provoking much more aggressive government spending, a much more accommodating perspective on debt, and a much greater openness to large-scale actions and investments of the kind that might plausibly reshape the world. And because decarbonization has come to seem, even to those economists and policy-makers blinded for decades to the moral and humanitarian cases for reform, a rational investment. “When I think about climate change,” Biden is fond of saying, “the word I think of is jobs.”

There are two ways of looking at these seemingly contradictory sets of facts. The first is that the distance between what is being done and what needs to be done is only growing. This is the finding of, among others, the U.N.’s comprehensive [“Emissions Gap” report](https://www.unenvironment.org/emissions-gap-report-2020), issued in December, which found that staying below two degrees of warming would require a tripling of stated ambitions. To bring the planet in reach of the 1.5-degree target — favored by activists, most scientists, and really anyone reading their work with open eyes — would require a quintupling. It is also the perspective of Greta Thunberg, who has spent the pandemic year castigating global leaders for paying mere lip service to far-off decarbonization targets and who called the E.U.’s new net-zero emissions law “surrender.”

The second is that all of the relevant curves are bending — too slowly but nevertheless in the right direction. The International Energy Agency, a notoriously conservative forecaster, recently [called](https://www.carbonbrief.org/solar-is-now-cheapest-electricity-in-history-confirms-iea#:~:text=Source%3A%20IEA%20World%20Energy%20Outlook%202020.&text=Together%2C%20low%2Dcarbon%20sources%20would,up%20from%2019%25%20in%202019.) solar power “the cheapest electricity in history” and projected that India will build 86 percent less new coal power capacity than it thought just one year ago. Today, business as usual no longer means a fivefold increase of coal use this century, as was once expected. It means pretty rapid decarbonization, at least by the standards of history, in which hardly any has ever taken place before.

Both of these perspectives are true. The gap is real, and the world risks tumbling into it, subjecting much of the global South to unconscionable punishments all the way down. But in the months since the pandemic wiped climate strikers off the streets, their concerns have seeped into not just public-opinion surveys but parliaments and presidencies, trade deals and the advertising business, finance and insurance — in short, all the citadels presiding over the ancien régime of fossil capital.

This is not exactly a climate revolution; the strikers and their allies didn’t win in the way they wanted to, at least not yet. But they did win something. Environmental anxieties haven’t toppled neoliberalism. Instead, to an unprecedented degree, they infiltrated it. (Or perhaps they were appropriated by it. It’s an open question.) Climate change isn’t an issue just for die-hards anymore — it’s for normies, sellouts, and anyone with their finger in the wind. It will take time, of course, for voters to see empty rhetoric for what it is, and for consumers to learn to distinguish, say, between the claims of guiltless airline tickets, or between carbon-free foods in the supermarket aisle. Harder still will be sorting through the differences between real corporate commitments like Microsoft’s and more evasive ones, like BP’s. Already, there is considerable consternation among climate activists that the public doesn’t understand the tricky math of “net-zero” on which so many of these commitments have been made—it is not a promise of ending emissions, but of offsetting some amount of them, in the future, with “negative emissions,” sometimes called “carbon dioxide removal,” though no approach of that kind is ready to go at anything like the necessary scale. And while some amount of skepticism about those commitments is surely warranted, it is also the case that, according to [a recent Bloomberg review](https://www.bloomberg.com/graphics/2020-company-emissions-pledges/), of 187 corporate climate pledges made for 2020 in 2015, 138 will be met. (Many of those promises were quite modest, but it is a much better performance than has been managed by the 189 parties to the Paris agreement, of which only two — Morocco and Gambia — are today [judged](https://climateactiontracker.org/countries/) fully “compatible” with the 1.5-degree goal, and only six more with the 2-degree target).

In the political sphere, the uneasy alliance between activists and those in power will be tested, producing new conflicts, or new equilibria, or both. Consider, though, that Varshini Prakash, whose [Sunrise Movement](https://www.sunrisemovement.org/) gave Biden’s primary candidacy an F, later helped write his climate plan along with Alexandria Ocasio-Cortez. Climate expertise has been distributed throughout the incoming administration, as was promised during a campaign that closed, remarkably, with a climate-focused advertising blitz. During the transition, Biden’s pick for director of the National Economic Council, Brian Deese, was targeted by the environmental left for his time with BlackRock, but even this purported stooge had been married by Bill McKibben, one of the godfathers of modern climate activism.

Elsewhere in the world, where 85 percent of global emissions are produced, the great infiltration of climate concerns represents what the British environmental [writer](https://www.businessgreen.com/blog-post/4025199/2020-crisis-crossroads-alternative-histories) James Murray has called “an alternative history to 2020” and what the scientist turned journalist Akshat Rathi [has declared](https://www.bloomberg.com/news/articles/2021-01-05/climate-action-is-embedding-into-how-the-world-works) “a strong sign that climate action is starting to be ‘institutionalized’ — that is, getting deeply embedded into how the world works.” This is not about coronavirus lockdowns producing emissions drops or “nature healing.” It is instead about long-standing trajectories passing obvious tipping points in coal use and political salience; promises and posturing by powerful if compromised institutions; and policy progress almost smuggled into place, all over the world, under cover of pandemic night. In the U.S., in the second coronavirus stimulus, [$35 billion in clean-energy spending](https://nymag.com/intelligencer/2020/12/what-is-in-covid-stimulus-omnibus-climate-pell-grants-medical-billing.html) passed in the Senate 92-6 — an effective down payment, energy researcher Varun Sivaram has estimated, on the innovation spending needed for a full electrification of the country. Did you even notice?

Biden’s climate plan now faces the challenge of a filibuster, a skeptical Supreme Court, and the mood of Senator Joe Manchin of West Virginia, which means American climate action over the next four years is probably more likely to be delivered piecemeal — through appropriations and stimulus, executive action, and regulation — than through a landmark Green New Deal–style piece of legislation. That does limit what can be achieved, but it also means avoiding a protracted battle over climate as a referendum on the identity of the nation. And at least nominally, having been pressured by activists to do so, Biden is promising to multiply the green spending in that recent stimulus by a factor of 60.

The numbers are numbingly large — reminders that in the midst of pandemic turmoil, the rules of state spending have been dramatically revised and perhaps even suspended. Is this global free-spending binge the beginning of a new era or merely a crisis interregnum to be followed by a new new austerity? “We don’t know what the recovery packages of COVID are going to be,” Christiana Figueres, one of the central architects of the Paris accords, told me this summer. “And honestly, the depth of decarbonization is going to largely depend on the characteristics of those recovery packages more than on anything else, because of their scale. We’re already at $12 trillion; we could go up to $20 trillion over the next 18 months. We have never seen — the world has never seen — $20 trillion go into the economy over such a short period of time. That is going to determine the logic, the structures, and certainly the carbon intensity of the global economy at least for a decade, if not more.”

For those dreaming of a climate recovery, the first round of spending was not so encouraging. The E.U. was the gold standard, promising that 30 percent of its stimulus would be earmarked for climate. The U.S. and China each pledged only a fraction of that (and in each case, there was fossil stimulus, too). But in October, a team of researchers including Joeri Rogelj of the Imperial College of London [calculated](https://www.reuters.com/article/climate-change-stimulus/tenth-of-pandemic-stimulus-spend-could-help-world-reach-climate-goals-study-idUSKBN271098) that just one-tenth of the COVID-19 stimulus spending already committed around the world, directed toward decarbonization during each of the next five years, would be sufficient to deliver the goals of the Paris agreement and stop global warming well below two degrees. That analysis may be a touch optimistic, but the level of spending seems, now, doable.

When Donald Trump was elected, trashing Paris, climate hawks were left hoping that the world would hang on for the length of his administration — insisting that, in the long term, the crisis couldn’t be solved without America at the helm. But the past four years of missing leadership have produced astonishing gains.

The price of solar energy has fallen ninefold over the past decade, as has the price of lithium batteries, critical to the growth of electric cars. The costs of utility-scale batteries, which could solve the “intermittency” (i.e., cloudy day) problem of renewables and help power whole cities in relatively short order, have fallen 70 percent since just 2015. Wind power is 40 percent cheaper than it was a decade ago, with offshore wind experiencing an even steeper decline. Overall, renewable energy is less expensive than dirty energy almost everywhere on the planet, and in many places it is simply cheaper to build new renewable capacity than to continue running the old fossil-fuel infrastructure. Oil demand and carbon emissions may both have peaked this year. Eighty percent of coal plants planned in Asia’s developing countries have been shelved.

This summer, I heard the Australian scientist and entrepreneur Saul Griffith talk about what it would take to get the U.S. within range of a 1.5 degree world. He said it would mean that beginning in 2021, this year, every single person buying a new car would have to be buying an electric one. That seems unrealistic, I thought, making a note of it as a useful benchmark illustrating just how far we have to go.

Then, in the fall, the U.K. pledged to ban nonelectrics by 2030—a once-unthinkable law coming both too slow and much more quickly than seemed possible not very long ago. Similar plans are now in place in 16 other countries, plus Massachusetts and California. Canada recently raised its tax on carbon sixfold. Italy cut its power-sector emissions 65 percent between 2012 and 2019, and Denmark is now aiming to reduce its overall emissions 70 percent by 2030. “We set ourselves challenges that on paper looked almost impossible,” the country’s minister for the environment, Dan Jørgensen, told me recently. “And I think experts in many countries said, when looking at Denmark, ‘This is going to be too expensive, this is going to lower their living standards, this is going to hurt their ability to compete.’ But actually I’m proud to say that the opposite has happened. Now, of course, we have set even higher standards.”

In the midst of the pandemic, new net-zero pledges, far more ambitious than those offered at Paris, were independently made by Japan, South Korea, the E.U., and, most significant, China, the world’s biggest emitter, which promised to reach an emissions peak by 2030 and get all the way to zero by 2060. China’s promise is so ambitious it has inspired one wave of debate among experts about whether it is even feasible — given that it would require, for instance, roughly twice as much renewable power to be installed every year for the next decade as Germany has operating nationwide today — and another debate about whether it has revived the possibility of that 1.5-degree target, with economic historian Adam Tooze writing, just after Xi Jinping’s surprise announcement in September, that it single-handedly “redefined the future prospects for humanity.” Together, the new net-zero pledges may have subtracted a full half-degree from ultimate warming. Add Biden’s campaign pledge of net zero by 2050, and you’ve got about two-thirds of global emissions at least nominally committed to firm, aggressive timelines to zero.

These are all just paper promises, of course, and the history of climate action is littered with the receipts of similar ones uncashed. Plot the growth of carbon concentration in the atmosphere against the sequence of climate-action conferences and a distressing pattern emerges: the World Meteorological Conference of 1979, the U.N. framework of 1992, the Kyoto protocol of 1997, the Copenhagen accord of 2009, and the 2015 Paris accords, all tracking an uninterrupted trajectory upward for carbon from a “safe” level under 350 parts per million, past 400, to 414 today, and pointing upward from there. Before the industrial revolution, humans had never known an atmosphere with even 300 parts per million. Inevitably now, within a few years, the concentration will reach levels not seen since 3.3 million years ago, when sea levels were 60 feet higher. For all their momentum, renewables still only make up 10 percent of global electricity production.

But alarmists have to take the good news where they find it. And while mood affiliation is not always the best guide to the state of the world, in 2020, for me, there were three main sources of hope.

The first is the fact that the age of climate denial is over thanks to extreme weather and the march of science and the historic labor of activists — climate strikers, Sunrise, Extinction Rebellion — whose success in raising alarm may have been so sudden that they brought an end to the age of climate Jeremiahs as well. Their voices now echo in some unlikely places. Exxon was booted from the S&P 500 within months of Tesla making Elon Musk the world’s richest man. The cultural cachet of oil companies is quickly approaching that of tobacco companies. Jair Bolsonaro of Brazil aside, practically every leader of every country and every major figure in every corporate and industrial sector now feels obligated — because of protest and social pressure, economic realities, and cultural expectation — to at least make a show of support for climate action. It would be nice not to have to count that as progress, but it is. The questions are: How much does it matter? And what will follow? Disinformation and human disregard are not the only instruments of delay, and the age of climate denial is likely to yield first not to an age of straightforward climate deliverance but to one characterized by climate hypocrisy, greenwashing, and gaslighting. But those things, ugly and maddening and even criminal as they are, have always been with us. It is the other thing that is new.

The second source of good news is the arrival on the global stage of climate self-interest. By this I don’t mean the profiteering logic of BlackRock, which opportunistically announced some half-hearted climate commitments last year, but rather the growing consensus in almost every part of the globe, and at almost every level of society and governance, that the world will be made better through decarbonization. A decade ago, many of the more ruthless capitalists to analyze that project deemed it too expensive to undertake. Today, it suddenly appears almost too good a deal to pass up. (A recent McKinsey [report](https://www.mckinsey.com/business-functions/sustainability/our-insights/how-the-european-union-could-achieve-net-zero-emissions-at-net-zero-cost): “Net-Zero Emissions at Net-Zero Cost.”)

The logic may be clearest in considering the effects of air pollution, which kills an estimated 9 million people per year. In India, where more than 8 percent of GDP is lost to pollution, poor air quality is also responsible for 350,000 miscarriages and stillbirths every year. Globally, coal kills one person for every thousand people it provides power to, and even in the U.S., with its enviably clean air, total decarbonization would be entirely paid for, Duke’s Drew Shindell [recently testified](https://www.vox.com/energy-and-environment/2020/8/12/21361498/climate-change-air-pollution-us-india-china-deaths) before Congress, just through the public-health benefits of cutting out fossil fuels. You don’t even have to calculate any of the other returns — more jobs, cheaper energy, new infrastructure. Of course, countries all around the world are incorporating those considerations too, turning the page on a generation of economic analysis that said decarbonization was too costly and its benefits too small to sell to the public as upside.

A decade ago, capitalists deemed decarbonization too expensive. Suddenly, it appears too good a deal to pass up.

What is perhaps most striking about all the new climate pledges is not just that they were made in the absence of American leadership but that they were made outside the boundaries of the Paris framework. They are not the result of geopolitical strong-arming or “Kumbaya” consensus. They are, instead, plans arrived at internally, in some cases secretly. This has been eye-opening for the many skeptics who worried for decades about climate’s collective-action problem — who warned that because the benefits of decarbonization were distributed globally while the costs were concentrated locally, nations would move only if all of their peers did too. But a [recent paper](https://www.mitpressjournals.org/doi/full/10.1162/glep_a_00578) by Matto Mildenberger and Michaël Alkin suggests this shouldn’t be a surprise. In their retrospective analysis, they found that, despite much consternation about designing climate policy to prevent countries from “cheating,” there was basically no evidence of any country ever pulling back from mitigation efforts to take a free ride on the good-faith efforts of others. There was, in other words, no collective-action problem on climate after all. For a generation, the argument for climate action was made on a moral basis. That case has only grown stronger. And now there are other powerful, more mercenary arguments to offer.

The third cause for optimism is that, while the timelines to tolerably disruptive climate outcomes have already evaporated, the timelines to the next set of benchmarks is much more forgiving. This is why Glen Peters, the research director at the Cicero Center for International Climate Research, often jokes that while keeping warming below two degrees is very hard, perhaps even impossible, keeping it below 2.5 degrees now looks like a walk in the park.

This isn’t to say we’re on a glide path to safety. At current emissions levels, the planet will entirely exhaust the carbon budget for 1.5 degrees in just seven years — stay merely level, in other words, and we’ll burn through the possibility of a relatively comfortable endgame within the decade. We could buy ourselves a little more time by starting to move quickly, but not that much more. To decarbonize fast enough to give the planet a decent chance of hitting that 1.5-degree target without any negative emissions would require getting all the way to net-zero emissions by around 2035. Simply running the cars and furnaces and fossil-fuel infrastructure that already exists to its expected retirement date would push the world past 1.5 degrees—without a single new gasoline SUV hitting the road, or a single new oil-heated home being built, or a single new coal plant opened.

A two-degree target, by contrast, yields a much longer timeline, requiring the world to achieve net-zero by 2070 or 2080 — without even the help of negative emissions. We’d have to cut carbon production in half in about three decades, rather than one. That pathway will almost certainly prove harder than it looks. The good news is that we seem to be beginning, at least, to try.

#### Technological innovation successfully dematerializes growth.

McAfee 19, \*Andrew Paul McAfee, a principal research scientist at MIT, is cofounder and codirector of the MIT Initiative on the Digital Economy at the MIT Sloan School of Management; (2019, “More from Less: The Surprising Story of How We Learned to Prosper Using Fewer Resources and What Happens Next”, https://b-ok.cc/book/5327561/8acdbe)

There is no shortage of examples of dematerialization. I chose the ones in this chapter because they illustrate a set of fundamental principles at the intersection of business, economics, innovation, and our impact on our planet. They are:

We do want more all the time, but not more resources. Alfred Marshall was right, but William Jevons was wrong. Our wants and desires keep growing, evidently without end, and therefore so do our economies. But our use of the earth’s resources does not. We do want more beverage options, but we don’t want to keep using more aluminum in drink cans. We want to communicate and compute and listen to music, but we don’t want an arsenal of gadgets; we’re happy with a single smartphone. As our population increases, we want more food, but we don’t have any desire to consume more fertilizer or use more land for crops.

Jevons was correct at the time he wrote that total British demand for coal was increasing even though steam engines were becoming much more efficient. He was right, in other words, that the price elasticity of demand for coal-supplied power was greater than one in the 1860s. But he was wrong to conclude that this would be permanent. Elasticities of demand can change over time for several reasons, the most fundamental of which is technological change. Coal provides a clear example of this. When fracking made natural gas much cheaper, total demand for coal in the United States went down even though its price decreased.

With the help of innovation and new technologies, economic growth in America and other rich countries—growth in all of the wants and needs that we spend money on—has become decoupled from resource consumption. This is a recent development and a profound one.

Materials cost money that companies locked in competition would rather not spend. The root of Jevons’s mistake is simple and boring: resources cost money. He realized this, of course. What he didn’t sufficiently realize was how strong the incentive is for a company in a contested market to reduce its spending on resources (or anything else) and so eke out a bit more profit. After all, a penny saved is a penny earned.

Monopolists can just pass costs on to their customers, but companies with a lot of competitors can’t. So American farmers who battle with each other (and increasingly with tough rivals in other countries) are eager to cut their spending on land, water, and fertilizer. Beer and soda companies want to minimize their aluminum purchases. Producers of magnets and high-tech gear run away from REE as soon as prices start to spike. In the United States, the 1980 Staggers Act removed government subsidies for freight-hauling railroads, forcing them into competition and cost cutting and making them all the more eager to not have expensive railcars sit idle. Again and again, we see that competition spurs dematerialization.

There are multiple paths to dematerialization. As profit-hungry companies seek to use fewer resources, they can go down four main paths. First, they can simply find ways to use less of a given material. This is what happened as beverage companies and the companies that supply them with cans teamed up to use less aluminum. It’s also the story with American farmers, who keep getting bigger harvests while using less land, water, and fertilizer. Magnet makers found ways to use fewer rare earth metals when it looked as if China might cut off their supply.

Second, it often becomes possible to substitute one resource for another. Total US coal consumption started to decrease after 2007 because fracking made natural gas more attractive to electricity generators. If nuclear power becomes more popular in the United States (a topic we’ll take up in chapter 15), we could use both less coal and less gas and generate our electricity from a small amount of material indeed. A kilogram of uranium-235 fuel contains approximately 2–3 million times as much energy as the same mass of coal or oil. According to one estimate, the total amount of energy that humans consume each year could be supplied by just seven thousand tons of uranium fuel.

Third, companies can use fewer molecules overall by making better use of the materials they already own. Improving CNW’s railcar utilization from 5 percent to 10 percent would mean that the company could cut its stock of these thirty-ton behemoths in half. Companies that own expensive physical assets tend to be fanatics about getting as much use as possible out of them, for clear and compelling financial reasons. For example, the world’s commercial airlines have improved their load factors—essentially the percentage of seats occupied on flights—from 56 percent in 1971 to more than 81 percent in 2018.

Finally, some materials get replaced by nothing at all. When a telephone, camcorder, and tape recorder are separate devices, three total microphones are needed. When they all collapse into a smartphone, only one microphone is necessary. That smartphone also uses no audiotapes, videotapes, compact discs, or camera film. The iPhone and its descendants are among the world champions of dematerialization. They use vastly less metal, plastic, glass, and silicon than did the devices they have replaced and don’t need media such as paper, discs, tape, or film.

If we use more renewable energy, we’ll be replacing coal, gas, oil, and uranium with photons from the sun (solar power) and the movement of air (wind power) and water (hydroelectric power) on the earth. All three of these types of power are also among dematerialization’s champions, since they use up essentially no resources once they’re up and running.

I call these four paths to dematerialization slim, swap, optimize, and evaporate. They’re not mutually exclusive. Companies can and do pursue all four at the same time, and all four are going on all the time in ways both obvious and subtle.

Innovation is hard to foresee. Neither the fracking revolution nor the world-changing impact of the iPhone’s introduction were well understood in advance. Both continued to be underestimated even after they occurred. The iPhone was introduced in June of 2007, with no shortage of fanfare from Apple and Steve Jobs. Yet several months later the cover of Forbes was still asking if anyone could catch Nokia.

Innovation is not steady and predictable like the orbit of the Moon or the accumulation of interest on a certificate of deposit. It’s instead inherently jumpy, uneven, and random. It’s also combinatorial, as Erik Brynjolfsson and I discussed in our book The Second Machine Age. Most new technologies and other innovations, we argued, are combinations or recombinations of preexisting elements.

The iPhone was “just” a cellular telephone plus a bunch of sensors plus a touch screen plus an operating system and population of programs, or apps. All these elements had been around for a while before 2007. It took the vision of Steve Jobs to see what they could become when combined. Fracking was the combination of multiple abilities: to “see” where hydrocarbons were to be found in rock formations deep underground; to pump down pressurized liquid to fracture the rock; to pump up the oil and gas once they were released by the fracturing; and so on. Again, none of these was new. Their effective combination was what changed the world’s energy situation.

Erik and I described the set of innovations and technologies available at any time as building blocks that ingenious people could combine and recombine into useful new configurations. These new configurations then serve as more blocks that later innovators can use. Combinatorial innovation is exciting because it’s unpredictable. It’s not easy to foresee when or where powerful new combinations are going to appear, or who’s going to come up with them. But as the number of both building blocks and innovators increases, we should have confidence that more breakthroughs such as fracking and smartphones are ahead. Innovation is highly decentralized and largely uncoordinated, occurring as the result of interactions among complex and interlocking social, technological, and economic systems. So it’s going to keep surprising us.

As the Second Machine Age progresses, dematerialization accelerates. Erik and I coined the phrase Second Machine Age to draw a contrast with the Industrial Era, which as we’ve seen transformed the planet by allowing us to overcome the limitations of muscle power. Our current time of great progress with all things related to computing is allowing us to overcome the limitations of our mental power and is transformative in a different way: it’s allowing us to reverse the Industrial Era’s bad habit of taking more and more from the earth every year.

Computer-aided design tools help engineers at packaging companies design generations of aluminum cans that keep getting lighter. Fracking took off in part because oil and gas exploration companies learned how to build accurate computer models of the rock formations that lay deep underground—models that predicted where hydrocarbons were to be found.

Smartphones took the place of many separate pieces of gear. Because they serve as GPS devices, they’ve also led us to print out many fewer maps and so contributed to our current trend of using less paper. It’s easy to look at generations of computer paper, from 1960s punch cards to the eleven-by-seventeen-inch fanfold paper of the 1980s, and conclude that the Second Machine Age has caused us to chop down ever more trees. The year of peak paper consumption in the United States, however, was 1990. As our devices have become more capable and interconnected, always on and always with us, we’ve sharply turned away from paper. Humanity as a whole probably hit peak paper in 2013.

As these examples indicate, computers and their kin help us with all four paths to dematerialization. Hardware, software, and networks let us slim, swap, optimize, and evaporate. I contend that they’re the best tools we’ve ever invented for letting us tread more lightly on our planet.

All of these principles are about the combination of technological progress and capitalism, which are the first of the two pairs of forces causing dematerialization.

#### 3---War---Cap solves nuclear war through interdependence---the alt’s disruption causes a transition war.

Drezner ’16 [Daniel; May 2016; Professor of International Politics at Tufts University, Ph.D. in Political Science and M.A. in Economics in Stanford University, B.A. in Political Economy from Williams College; Brookings Institution, “Five Known Unknowns about the Next Generation Global Political Economy,” <https://www.brookings.edu/wp-content/uploads/2016/07/IOS-Drezner-web.pdf>]

Multiple scholars have observed a secular decline in interstate violence in recent decades.105 The Kantian triad of more democracies, stronger multilateral institutions, and greater levels of cross-border trade is well known. In recent years, international relations theorists have stressed that commercial interdependence is a bigger driver of this phenomenon than previously thought.106 The liberal logic is straightforward. The benefits of cross-border exchange and economic interdependence act as a powerful brake on the utility of violence in international politics. The global supply chain and “just in time” delivery systems have further imbricated national economies into the international system. This creates incentives for governments to preserve an open economy even during times of crisis. The more that a country’s economy was enmeshed in the global supply chain, for example, the less likely it was to raise tariffs after the 2008 financial crisis.107 Similarly, global financiers are strongly interested in minimizing political risk; historically, the financial sector has staunchly opposed initiating the use of force in world politics.108 Even militarily powerful actors must be wary of alienating global capital.

Globalization therefore creates powerful pressures on governments not to close off their economies through protectionism or military aggression. Interdependence can also tamp down conflicts that would otherwise be likely to break out during a great power transition. Of the 15 times a rising power has emerged to challenge a ruling power between 1500 and 2000, war broke out 11 times.109 Despite these odds, China’s recent rise to great power status has elevated tensions without leading to anything approaching war. It could be argued that the Sino-American economic relationship is so deep that it has tamped down the great power conflict that would otherwise have been in full bloom over the past two decades. Instead, both China and the United States have taken pains to talk about the need for a new kind of great power relationship. Interdependence can help to reduce the likelihood of an extreme event—such as a great power war—from taking place.

Will this be true for the next generation economy as well? The two other legs of the Kantian triad—democratization and multilateralism—are facing their own problems in the wake of the 2008 financial crisis.110 Economic openness survived the negative shock of the 2008 financial crisis, which suggests that the logic of commercial liberalism will continue to hold with equal force going forward. But some international relations scholars doubt the power of globalization’s pacifying effects, arguing that interdependence is not a powerful constraint.111 Other analysts go further, arguing that globalization exacerbates financial volatility—which in turn can lead to political instability and violence.112

A different counterargument is that the continued growth of interdependence will stall out. Since 2008, for example, the growth in global trade flows has been muted, and global capital flows are still considerably smaller than they were in the pre-crisis era. In trade, this reflects a pre-crisis trend. Between 1950 and 2000, trade grew, on average, more than twice as fast as global economic output. In the 2000s, however, trade only grew about 30 percent more than output.113 In 2012 and 2013, trade grew less than economic output. The McKinsey Global Institute estimates that global flows as a percentage of output have fallen from 53 percent in 2007 to 39 percent in 2014.114 While the stock of interdependence remains high, the flow has slowed to a trickle. The Financial Times has suggested that the global economy has hit “peak trade.”115

If economic growth continues to outstrip trade, then the level of interdependence will slowly decline, thereby weakening the liberal constraint on great power conflicts. And there are several reasons to posit why interdependence might stall out. One possibility is due to innovations reducing the need for traded goods. For example, in the last decade, higher energy prices in the United States triggered investments into conservation, alternative forms of energy, and unconventional sources of hydrocarbons. All of these steps reduced the U.S. demand for imported energy. A future in which compact fusion engines are developed would further reduce the need for imported energy even more.116

A more radical possibility is the development of technologies that reduce the need for physical trade across borders. Digital manufacturing will cause the relocation of production facilities closer to end-user markets, shortening the global supply chain.117 An even more radical discontinuity would come from the wholesale diffusion of 3-D printing. The ability of a single printer to produce multiple component parts of a larger manufactured good eliminates the need for a global supply chain. As Richard Baldwin notes, “Supply chain unbundling is driven by a fundamental trade-off between the gains from specialization and the costs of dispersal. This would be seriously undermined by radical advances in the direction of mass customization and 3D printing by sophisticated machines…To put it sharply, transmission of data would substitute for transportation of goods.”118 As 3-D printing technology improves, the need for large economies to import anything other than raw materials concomitantly declines.119

Geopolitical ambitions could reduce economic interdependence even further.120 Russia and China have territorial and quasi-territorial ambitions beyond their recognized borders, and the United States has attempted to counter what it sees as revisionist behavior by both countries. In a low-growth world, it is possible that leaders of either country would choose to prioritize their nationalist ambitions over economic growth**.** More generally, it could be that the expectation of future gains from interdependence—rather than existing levels of interdependence—constrains great power bellicosity.121 If great powers expect that the future benefits of international trade and investment will wane, then commercial constraints on revisionist behavior will lessen. All else equal, this increases the likelihood of great power conflict going forward.

There have been other drivers of the decades-long reduction in militarized interstate disputes. Nuclear deterrence has helped curb violent conflict among the great powers. Multilateral peacekeeping missions mitigate small country conflicts. Even if there is a decline in interdependence, it is possible that the “Long Peace” will endure. Furthermore, it is impossible to predict the degree to which either innovations or geopolitics will lessen the need for international trade. Even technological optimists acknowledge that the future diffusion of 3D printing is unclear. Advocates of networked manufacturing insist that economic openness is a prerequisite for the process to continue.122 And the degree of geopolitical revisionism among great powers might be endogenous—that is to say, preexisting levels of globalization might constrain revisionist impulses, rather than such impulses weakening the globalized economy.

If great powers resort to revisionist foreign policies, however, then the global economy will start to resemble the Cold War era of economic blocs and strategic embargoes—one in which trade and investment follow the flag rather than follow the rate of return. The increased American use of targeted financial sanctions, for example, has already generated grumblings from peer competitors about finding ways to diversify away from reliance upon the dollar.123 In 2015, China introduced its own international payment and settlements system, in part, to diversify away from reliance upon the dollar.124 The correlation of economic flows with geopolitical alliances would not just have a profound effect on cross-border flows; it would likely lead to the fragmentation of global economic governance. Just as significantly, great power governments would reverse post-Cold War trends and choose to allocate more scarce resources towards their militaries.

#### 4---Reject their evidence---Ahmed is a 9-11 truther with no legitimate qualifications.

CC 14 3/22/14 (“The Guardian deserves better than Nafeez Ahmed”, https://carboncounter.wordpress.com/2014/03/22/i-do-not-understand-what-i-am-talking-about/)//DG

Nafeez Ahmed appears to have jumped the shark, if such a thing is possible in his case. On Friday Keith Kloor provided a thorough critique of both Mr. Ahmed’s journalistic methods and of his story claiming that a “NASA funded study” found that civilization may be about to collapse. You would think that Mr. Ahmed would have taken a step back when NASA publicly distanced themselves from the claim they supported the study, but no. Instead Mr. Ahmed comes out with guns blazing claiming NASA did fund the study. This is truly bizarre behaviour. He quotes NASA saying they “did not solicit” the research. This should end the debate. What does he imagine NASA means by “did not solicit”? Mr. Ahmed however persists in claiming NASA was behind the study. At this point someone at the Guardian should step in and stop this man from damaging its reputation, hand him a dictionary, and require that he takes basic journalism training. Everything else in the piece is little but an appeal to authority. This is all rather curious. A man who spends half of his time concocting conspiracy theories about authorities spends the other half appealing to authority. (He also seems to be spend part of his time removing 9/11 conspiracy theories from his website, as I documented here.) In his piece he also refers to me as an “obscure student”, who “does not understand what they are talking about.” This may or may not be true, but the evidence he presents is non-existent. I provided a number of specific criticisms of the applicability of the HANDY model to modern civilizations, and he has responded by quoting a general statement about the model by Rodrigo Castro. This makes it clear that it is Mr. Ahmed who does not understand what he is talking about. If he did he could very easily address my specific criticisms. Instead he dangles quotes in front of the reader in the hope that this will convey some impression of understanding. Anyone familiar with Mr. Ahmed’s writings will recognise the approach. And I should also point out that the lead author of the paper he cites is also a fellow PhD student. Perhaps he too should be called an “obscure student.” “New paper by PhD student” certainly lacks the pizazz of “NASA funded study”, does it not? And it would be a much more accurate reflection of reality than that presented in Mr. Ahmed’s “journalism.” Similarly he is incapable of responding to any of the criticisms made by the scientists in Keith Kloor’s piece. For example he responds to remarks made by Joseph Tainter by pointing out that Tainter is not always correct. Is this an argument? Again, Mr. Ahmed’s complete unwillingness to address specific criticisms is telling. Things get worse when he essentially libels Keith Kloor by claiming that he is a closet climate change denier. Mr. Ahmed then rapidly switches from being an upholder of scientific consensus to someone who denigrates it, quoting a group of scientists who challenge the scientific consensus that GM crops are safe. Mr. Kloor’s upholding of the scientific consensus on the safety of GM crops is absurdly held up as evidence that he is a “junk” journalist. I guess this kind of thing can be expected of someone who believes the US government had a role in flying two planes into the World Trade Centre on September 11th 2001. Anything goes for the average conspiracy theorist, and we should neither demand or expect intellectual and moral coherence from them.

#### Alt fails:

#### 1---can’t solve innovation.

Kornai 13, \*János Kornai is a Hungarian economist and the Allie S. Freed Professor of Economics Emeritus at Harvard and Professor Emeritus at Corvinus University of Budapest; (János, November 6th, 2013, “Dynamism, Rivalry, and the Surplus Economy”, DOI:10.1093/acprof:oso/9780199334766.001.0001, Google Books)

C. There is no competition between producers and sellers. Production is strongly concentrated. Many companies enjoy monopolist positions, or at least a (regional) monopoly in producing an entire group of products. The chronic shortage of products creates monopolistic behavior even when many producers operate in parallel. The shortage economy, one of the strongest system-specific properties of socialism, ~~paralyzes~~ impedes the forceful engine of innovation, the incentive to fight for the favors of the customer ( Kornai 1971 ; 1980; 1992, chapters 11 – 12 ). The producer/seller is not compelled to attract the buyer by offering him a new and better product, since the latter is happy to get anything in the shop, even an obsolete and poor-quality product.

There are examples of inventive activities motivated by chronic shortages: ingeniously created substitutes for missing materials or machinery parts (Laki 1984 –1985). These results of the inventors’ creative mind, however, do not become widespread, commercially successful innovations in the Schumpeterian sense. 25 Table 2.1 features only one revolutionary innovation that did not appear first in a capitalist country but, rather, in the Soviet Union: synthetic rubber. Its inventor had been doing research on the subject for decades; the employment of it in industry was rendered necessary by the shortage of natural rubber.

D. The tight limits of experimenting. Capitalism allows for hundreds or thousands of barren or barely fruitful attempts, so that, afterward, one out of the hundreds or thousands would succeed and bring immense success. In the socialist planned economy, actors are inclined to avoid risks. As a result, the application of revolutionarily significant innovations are more or less excluded, since those always mean a leap into the dark, as success is necessarily unpredictable. As far as followers are concerned, some economies follow up quickly, others slowly. The socialist economies belong to the group characterized by the slowest pace. They prefer to maintain the already known, old production procedures, and produce the old well-tried products; new technologies and new products have too many uncertain characteristics making the planning of the directives difficult.

E. There is no capital waiting to be utilized; investment allocation is rigid. Central planning is not miserly with the resources devoted to capital formation. The share of investment carved out from the total output is typically higher than in the capitalist economies. However, this enormous volume is appropriated ahead of time to the last penny. Moreover, most of the time over-allocation takes place; in other words, the ensemble of all project plans prescribes the requisition of more resources than the required amount to execute the plan. It never happens that unallocated capital is waiting for someone with a good idea. The allocators do not search for an entrepreneur waiting to step forward with a proposal for innovation. Flexible capital markets are unknown. Instead, the rigid and bureaucratic regulation of project activities takes place, and to devote capital resources to activities with possibly uncertain outcomes is unconceivable. No foolish minister of industry or factory manager could be found who would demand money for ventures admitting in advance that the money may be wasted and the innovation may not succeed. 26

#### 2---Capitalism resilient---conservatives, billionaires, and corporations derail the alt.

Snider 20, Professor Emerita, Department of Sociology, Queen's University, Canada. (Laureen, 6-1-2020, "Beyond Trump: Neoliberal Capitalism and the Abolition of Corporate Crime", Volume: 1 issue: 2, *Journal of White Collar and Corporate Crime*, https://journals.sagepub.com/doi/full/10.1177/2631309X20920837?casa\_token=JlSVKgboXfEAAAAA%3A630fheyCWDZA9H\_dUP270QwjXLWuvhVuh3mHR9dvRxh04QXhsVspnAgiq71IgLGPDDAiKVlx4MHG)

Understanding the Sustained Strength of U.S. Capitalism

This section asks whether Trump’s unashamed, wholesale disavowal of the idea that regulatory agencies are necessary to protect citizens from cost-externalizing corporations (whatever the damage to employees, environment, and global economic systems) will destabilize capitalism in the United States. It argues that a unique social, economic, historical (particularly the legacy of slavery), and political constellation of factors makes U.S. capitalism particularly resilient—at least in the short term.10

There are numerous reasons for this resilience. First and foremost, the enormous strength—political, cultural, and economic—of right-wing forces in the United States. For decades, right-wing billionaires and their corporations have sought to reshape American institutions, and the belief systems and practices that sustain them, to further their own interests. Academics now have a rich trove of empirical knowledge documenting a century of efforts by America’s ultra-wealthy class to persuade citizens that democratic governments and liberal elites are the enemies of freedom, individual rights, and all the things that make America “the land of the free” and the home of the superrich. Their efforts to make the world safe for the wealthiest began over a century ago when families such as the Mellons (DuPont and banking), Olins (oil), Coors (beer), and other corporate elites, infuriated by the antitrust laws and the inauguration of a federal income tax in 1913, set up private foundations, purportedly devoted to charitable works and nonpolitical causes. Among these are the American Enterprise Institute, the Heritage Foundation, the Charles Koch Foundation, and many others whose main purposes were to promote right-wing, anti-government views.11 The Koch Foundation, for example, has given millions of dollars to a select number of universities to endow chairs in Law and Economics in order to counter “liberal” social science research and scholarship (Mayer, 2016). For example, George Mason University in North Virginia received $16.5 million in 2014, and 13 others got gifts only slightly smaller to fund disciplines and departments seen as promoting pro-capitalist knowledge claims.

Then, there are the billions of dollars corporations spend on “public service messages” stressing their public service and social responsibility and telling us how they have brought prosperity to millions of people in Asia and Africa. In the quest to transform citizens into consumers, millions of commercials saturate our physical and social space, hammering home the message that consuming the products these corporations make us are desirable and that the failure to consume marks us as losers. Individualist ideologies such as the American Dream maintain that every American can and will be better off (materially) than their parents (The Opportunity Agenda, 2011). A mere 3 years after the worst financial crisis in decades, 59% of Americans said they were living “the American Dream,” and 75% still believed it was an achievable goal for “people like them” (The Opportunity Agenda, 2011).12 Even worse, for those who believe in a progressive agenda, the number of Americans who believed poverty was caused by “circumstances beyond [their] control” was tied with those who saw the cause as “lack of effort” in 1988. By 1995, twice as many blamed poverty on “lack of effort” not on “circumstances beyond their control” (The Opportunity Agenda, 2011).

This “colonization of public consciousness” (Rothe & Collins, 2018, p. 246) is a vital component in neoliberalism’s incessant battle to maintain control. Domination through consent is both cheaper and more sustainable than repression and coercion, but consent is always fragile and constantly threatened—by a coronavirus, a depression, a massacre that becomes visible, and a stock market that crashes. Hegemony,13 defined as a particular ideology that permeates all institutions and social relations (Gramsci, 1971; Pearce, 1976), works best if repression and coercion are seen as reserved for those already disempowered by race, class, gender, and political affiliation such as “socialists,” “criminals,” “terrorists,” or “illegal immigrants” (the “other”). However, in most capitalist states, battles to maintain consent for capitalist agendas occur “under the radar,” outside public view. Policies that let corporations “get away with murder” (literally in many cases) are justified as necessary to ensure that business is “competitive” or because “there is no alternative” to the status quo (Glasbeek, 2018). Government actors and media constantly tell us that our social system and the existing—extremely unequal—distribution of resources work in the interests of everyone.

The Trump administration is notable because it offers so few justifications! Few efforts are made to persuade citizens that destroying regulation is in everyone’s interests. Trump’s spokespeople assume everyone knows that government is bad and private enterprise is good; therefore, destroying restrictions on business is something to be celebrated. All of this is the legacy of decades of ideological labor by the Kochs and Olins and their allies in media outlets such as Fox and talk radio. Getting rid of government restrictions is “obviously” the key to “making America great again.”

This does not mean the United States has escaped the worldwide surge of protest that followed the financial debacle of 2008, which ruined the incomes and destroyed the futures of millions of people. Nor does it mean that progressive change will come easily elsewhere, though countries that have retained some vestiges of democratic socialism (such as Sweden and Germany) should have an advantage over those that wholeheartedly bought into neoliberal global capitalism. The outrage that the perpetrators of this outrage were bailed out by the very citizens they robbed, and none have served prison time (Friedrichs, 2011), has fueled an unprecedented number of left-wing protests around the world—for example, the Occupy movement, Black Lives Matter, and the Women’s March on Washington in the United States. The fruit of these protests—and of similar movements in Italy, Turkey, Hungary, and Brazil—seems to have been the election of right-wing, authoritarian governments. As Younge (2019) argues, “It is in the nature of protests that…they highlight problems they are not equipped to solve…they cleared more space for the left than it could hold, either electorally or politically” (p. 35). President Obama and the Hilary Clinton forces were unable to capture and build on the anger these conditions produced. Donald Trump and his army of libertarian and conservative allies did.

It is difficult for those seeking a more just and equal society to fight neoliberal global capitalism because it is both everywhere and nowhere, it is who we are and how we live. And I suspect that progressives have underestimated the strength of the opposition. As Robinson (2017) argued,

Global capitalism faces an unprecedented crisis of social polarization, political legitimacy (hegemony), sustainability, and overaccumulation. [It] has accumulated trillions of dollars that it is finding ever harder to “unload.” In recent years it has turned to mind-boggling levels of financial speculation, to the raiding and sacking of public budgets, and to what I call militarized accumulation—that is, to endless cycles of war, destruction, and reconstruction; to “accumulation by repression” (building of private prisons and immigrant detention centers, border walls, homeland security technologies, etc.); and to the construction of a global police state to defend the global war economy from rebellions from below.

While a new government, should Trump lose the 2020 election, will certainly attempt to change many Trump-era policies, it will be hard to reverse the deregulatory tide for all the reasons we have just discussed. Klein (2020) argues that political choice is now so wrapped up in peoples’ personal identities—their ethnicity, religiosity, region, the radio stations, cars and beverages they consume, what they read, and where they read it—that no candidate can seriously alter the voting choices of most of the population. It is also true that regulators are not an easy constituency to defend—they are by definition makers and enforcers of other peoples’ rules. In a society where “liberty” and “freedom” are engrained in the constitution, the idea of submitting to such rules is anathema. And many people have had negative experiences with a government representative on a power trip or been forced to deal with endless levels of bureaucratic obfuscation that are (wrongly) seen as unique to government14 (Try lodging a complaint against your wireless provider or getting redress from an airline!). Such encounters now live forever on social media. There is evidence, too, that Americans are much more suspicious of government and of collective/public initiatives than citizens in capitalist democracies in Europe, Scandinavia, or Canada (Friedman, 2018). America has a unique belief system, where individualism, gun culture, racism, and religiosity have merged. The 30%–40% of the population who have forged their identities around these beliefs are the core of Trump support and will be a significant impediment to any progressive regime.

#### 3---Alt can’t solve climate change fast enough.

Piper 21, \*Kelsey Piper, a Staff Writer for Vox's new vertical; (August 3rd, 2021,“Can we save the planet by shrinking the economy?”, https://www.vox.com/future-perfect/22408556/save-planet-shrink-economy-degrowth)

Degrowth is unrealistic — and gaining traction

As a policy program, degrowth suffers from being both too radical and not radical enough.

There’s a lot of broad-brush policy prescriptions in the degrowth lit, but those details never really add up.

While it’s not a short book, Less Is More feels surprisingly sparse when it comes to envisioning how the changes it recommends could be brought about. The chapter on solutions recommends cutting the workweek and changing tax policy — two solid proposals — but then rounds that out by recommending ending technological obsolescence, advertising, food waste, and student debt.

I’m not particularly opposed to those policies. But they seem laughably inadequate for the magnitude of the task at hand: confronting the climate crisis. Degrowth successfully persuades that guiding humanity and our planet through the 21st century will be really, really hard — but not in a way degrowth particularly solves.

Where degrowth literature is relentlessly pessimistic about the prospect of our problems being solved under our current economic system, it turns oddly optimistic about the prospect that they’ll be solved once we embrace a different way of viewing wealth and progress. If cutting carbon emissions fast enough to matter requires shrinking the global economy by 0.5 percent a year indefinitely, starting right now, as the Nature paper estimates, that’ll take policy measures much larger and more ambitious than any proposed in Less Is More.

“If we are to avert catastrophic warming, we have to lower carbon emissions by a factor of two within the next 10 years. I find it highly implausible that capitalism/market economics will be abandoned by the world on that time frame,” Pennsylvania State University climatologist Michael Mann told me. “That means we have to act on the climate crisis within the framework of the current system.”

In that sense, there’s actually something anti-radical about any climate plan so radical that it can’t be concretely brought about in the next decade.

## AT: CP---STATE ANTITRUST

### 2AC---Deficits

#### The Ninth Circuit imposed court-order limitations on antitrust law to preserve its balance with patent law.

Martino et al. 20, \*[Matthew M. Martino](https://www.skadden.com/professionals/m/martino-matthew-m) [Tara L. Reinhart](https://www.skadden.com/professionals/r/reinhart-tara-l) [Steven C. Sunshine](https://www.skadden.com/professionals/s/sunshine-steven-c) [Julia K. York](https://www.skadden.com/professionals/y/york-julia-k), works with clients at Skadden, Arps, Slate, Meagher & Flom LLP; (August 14th, 2020, “Ninth Circuit Strikes Down Sweeping Injunction Against Qualcomm and Reins In Expansive Interpretation of Sherman Act”, https://www.skadden.com/insights/publications/2020/08/ninth-circuit-strikes-down-sweeping-injunction)

In its highly anticipated decision, the Ninth Circuit panel unanimously rejected the lower court’s reasoning, vacating the judgment and reversing the worldwide injunction against Qualcomm. The panel concluded that the district court had erroneously imposed the antitrust duty to deal on Qualcomm, had impermissibly looked outside the relevant antitrust market in order to infer an anticompetitive act and had relied on outdated evidence of agreements that were terminated before the suit was filed to justify a broad, forward-looking global injunction. The Ninth Circuit further rejected the argument that a SEP holder’s violation of FRAND commitments could independently create antitrust liability, instead pointing to patent and contract law as sources for potential remedies. The decision reflects a considered effort to rei

n in the district court’s expansive interpretation of general antitrust principles and their specific application to SEP holders, as well as recognition that the antitrust laws aim to preserve companies’ incentives to innovate and compete. Recognizing that while “[a]nticompetitive behavior is illegal under federal antitrust law[,]” the panel was adamant that “[h]ypercompetitive behavior is not.”[7](https://www.skadden.com/insights/publications/2020/08/ninth-circuit-strikes-down-sweeping-injunction" \l "ftn7)

Rejection of District Court’s Expansive Interpretation of Antitrust Laws

The Ninth Circuit decision contains several notable conclusions regarding the scope of Section 2 of the Sherman Act and what constitutes cognizable antitrust harm.

#### State efforts to impose greater antitrust liability than established by federal courts will be preempted to protect that balance.

Samp 14, \*Richard A. Samp is the chief counsel for Washington Legal Foundation (WLF), a non-profit, public interest law firm in Washington, D.C. WLF filed an amicus brief in support of Love Terminal Partners. (2014, “The Role of State Antitrust Law in the Aftermath of Actavis”, https://scholarship.law.umn.edu/cgi/viewcontent.cgi?article=1062&context=mjlst)

V. ACTAVIS’S PREEMPTIVE EFFECT

Application of state antitrust law to reverse payment settlements is not merely a hypothetical possibility. There are a fair number of pending lawsuits that challenge reverse payment settlements on state-law grounds. The California Supreme Court has agreed to review one such suit.74 In seeking affirmance of the appeals court’s dismissal of the suit, the defendants argue inter alia that the suit is preempted by federal law.75

As noted above, there is precedent for a finding that state antitrust law is preempted to the extent that it conflicts with the policy underlying a federal statute.76 Moreover, in the context of patent law, federal courts have not hesitated to preempt state laws that the courts deem to stand as an obstacle to accomplishing Congress’s objectives (i.e., encouraging efforts to develop new and useful products).77 To the extent that any portions of Actavis’s holding can be deemed to reflect the Court’s perception of Congress’s new-product-development objectives, a state law is preempted if it is inconsistent with that holding and seeks to impose a greater degree of antitrust liability on the parties to a reverse payment settlement.

Actavis’s treatment of settlements involving a compromise entry date appears to meet that description. Actavis held that federal antitrust liability could not arise from a settlement in which the generic manufacturer agrees not compete for a number of years and in return is rewarded with an exclusive license to market its product several years in advance of the patent’s expiration date.78 Accordingly, states are not permitted to impose antitrust liability under similar circumstances because doing so would upset the balance that, according to Actavis, Congress sought to achieve between antitrust and patent law.

Other issues left open by Actavis are likely to be answered in the years ahead. For example, the Supreme Court did not specify whether noncash benefits received by a generic manufacturer in connection with a patent settlement can ever serve as the basis for federal antitrust liability. If the Supreme Court eventually answers that question by stating: “No, federal antitrust law will not examine settlement benefits other than cash that flow to the infringing party,” then it is likely that state antitrust law would be required to conform to that rule. The potential grounds for such a ruling (a desire both to promote settlement of patent disputes and to uphold reliance interests in existing patents) are based largely on values embedded in federal patent law.

There is little reason to believe, however, that the Court would prevent application of state antitrust law to patent settlement agreements where state law is fully consistent with federal antitrust law. Even in areas subject to extensive federal regulation, the Supreme Court has upheld the authority of states to engage in parallel regulation that is not inconsistent with the federal regulation.79 Unless the Court were to determine, as in Connell,80 that states could not be trusted to properly accommodate the objectives of the federal statute at issue (here, federal patent law), there is no reason to conclude that Congress would not have wanted states to be permitted to police the same sorts of anticompetitive conduct that is policed by federal antitrust law. Moreover, states are likely free to impose greater penalties on the proscribed conduct than is available under federal law. As the Court explained in California v. ARC America Corp., state antitrust law is not required to adhere to the same set of sanctions imposed by federal antitrust law.81

It seems reasonably clear, however, that Actavis prohibits states from adopting the procedural devices rejected by the U.S. Supreme Court—either a per se condemnation of reverse payment settlements or a presumption of illegality accompanied by “quick look” review. The Supreme Court rejected those approaches because it determined that in many cases there might well be pro-competitive economic justifications for reverse payment settlements and that presuming their illegality could result in the suppression of economically useful conduct.82 State antitrust laws that adopted the FTC’s proposed presumption of illegality would be subject to similar criticism, and thus would likely be impliedly preempted as inconsistent with the careful balance between antitrust and patent law established by Actavis.

CONCLUSION

Because Actavis left so many questions unanswered regarding the application of federal antitrust law to patent settlement agreements, the extent to which federal law preempts the application of state antitrust law to such agreements remains similarly unsettled. One can be reasonably confident that if private plaintiffs become dissatisfied with the results of pending litigation under federal antitrust law, they will turn with increasing frequency to state antitrust law as an alternative remedy. Even if state law ends up doing no more than “parallel” federal antitrust law, defendants are likely to incur substantial litigation costs fending off such state claims in the years to come.

## AT: DA---COURT CAPITAL

### 2AC---Thumpers

#### Apple case thumps---it’s politicized, and has ripple effects across antitrust.

Albertgotti 9/10/21, \*[Reed Albergotti](https://www.washingtonpost.com/people/reed-albergotti/), Washington Post; (September 10th, 2021, “Judge’s ruling may take a bite out of Apple’s App Store, but falls short of calling the iPhone maker a monopolist”, https://www.washingtonpost.com/technology/2021/09/10/apple-epic-decision-judge-market-monopoly/)

A federal judge fundamentally altered Apple’s App Store business model on Friday in a landmark ruling that accused the iPhone maker of illegal anticompetitive behavior and is likely to have ripple effects across the U.S. antitrust landscape.

In a decision on an antitrust lawsuit brought by Fortnite maker Epic Games, U.S. District Judge Yvonne Gonzalez Rogers ruled that Apple must allow app developers to “steer” customers to alternatives to the tech giant’s payment processing service, which collects a 30 percent fee on most digital transactions. That was previously not allowed by the company, and marks a major victory for developers which have long complained of the tight grip the tech giant holds over its App Store on the roughly one billion iPhones currently in use.

[The blockbuster trial between Apple and the maker of ‘Fortnite’ goes out with a ‘hot tub’ session](https://www.washingtonpost.com/technology/2021/05/24/apple-epic-trial-hot-tubbing/?itid=lk_interstitial_manual_5)

Gonzalez Rogers also found that Apple was in violation of California state competition laws because of the way it forces developers into using Apple’s payment processing service without allowing them to tell customers there are alternatives, which are often cheaper.

She stopped short of ruling in favor of Epic‘s claims that Apple is a monopolist, although she left the door open by suggesting more evidence could have changed her decision.

“The court does not find that it is impossible; only that Epic Games failed in its burden to demonstrate Apple is an illegal monopolist,” she wrote.

Epic spokeswoman Elka Looks said the company plans to appeal the ruling. Tim Sweeney, chief executive of Epic, said in a tweet that, “Today’s ruling isn’t a win for developers or for consumers.”

Apple did not respond to requests for comment.

The ruling, one of the first major legal actions taken against a tech giant in a new era of antitrust scrutiny, is sure to echo loudly both in Washington, where a legislative effort to rein in the power of Big Tech is underway, and in the courts, which are facing the biggest test of existing antitrust laws in decades. Tech giants have come under the microscope in recent years as it became clear that current antitrust law does not effectively address their power, and regulators and lawmakers have been pushing to change that.

#### NCAA ruling thumps.

Edelman 21, \*Marc Edelman is Professor of Law at the Zicklin School of Business (City University of New York), where he focuses on sports, antitrust, gaming, and intellectual property law; (June 21st, 2021, “Supreme Court’s Ruling Against NCAA In College Athlete Pay Case Rests On Decades Of Legal Precedent”, https://www.forbes.com/sites/marcedelman/2021/06/21/as-earlier-predicted-us-supreme-court-rules-against-ncaa-9-0/?sh=2a6bd796824b)

Back in April, I [predicted on Forbes.com](https://www.forbes.com/sites/marcedelman/2021/04/05/seven-reasons-why-the-ncaa-is-likely-to-lose-its-supreme-court-case/) that the National Collegiate Athletic Association would lose its Supreme Court antitrust case, NCAA v. Alston, in a 9-0 ruling. At the time, I explained that the most interesting question in this case would not be who would win but rather whether the U.S. Supreme Court would go even further than the U.S. Court of Appeals in reining in what the NCAA currently calls “amateurism.”

Today, we [got our answer](https://www.supremecourt.gov/opinions/20pdf/20-512_gfbh.pdf). The NCAA indeed did lose its Supreme Court case, 9-0. And Justice Brett Kavanaugh, [channeling a view of the NCAA expressed earlier](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2226541), took the time to write a concurring opinion that put the writing on the wall that many other NCAA rules—beyond just limits on educational-related, in-kind benefits—might also one day be found to violate Section 1 of the Sherman Act.

### 2AC---Bipartisan

#### Plan is bipartisan.

Contreras 18, \*Jorge L. Contreras teaches in the areas of intellectual property law, property law and genetics and the law at the University of Utah. He has recently been named one of the University of Utah's Presidential Scholars, and won the 2018-19 Faculty Scholarship Award from the S.J. Quinney College of Law. Professor Contreras has previously served on the law faculties of American University Washington College of Law and Washington University in St. Louis, and was a partner at the international law firm Wilmer Cutler Pickering Hale and Dorr LLP, where he practiced transactional and intellectual property law in Boston, London and Washington DC; (August 2018, “Taking it to the Limit: Shifting U.S. Antitrust Policy Toward Standards Development”, https://dc.law.utah.edu/cgi/viewcontent.cgi?article=1114&context=scholarship)

This being said, antitrust policy regarding standard-setting, and hold-up in particular, did not previously appear to run along party lines. In fact, many key DOJ position statements regarding hold-up, including those expressed in its 2006 and 2007 business review letters to VITA and IEEE, respectively, and the 2007 report on antitrust and IP that it produced jointly with the FTC, were developed during the Republican George W. Bush Administration. Each of these documents acknowledged the existence and potential anticompetitive effects of hold-up. At least in this area, the Obama DOJ did not appear to deviate significantly from the policies of prior administrations. As observed by FTC Commissioner Terrell McSweeny, the FTC and prior DOJ approach to combatting hold-up were based on “15 years of scholarship and bipartisan study” and should not lightly be discarded.37

### 2AC---Court Capital Theory False

#### Court capital isn’t transferrable.

Redish 95, \*Martin, Louis and Harriet Ancel Professor of Law and Public Policy at Northwestern University School of Law, teaches and writes on the subjects of federal jurisdiction, civil procedure, freedom of expression and constitutional law; (“The Constitution as Political Structure”, https://books.google.com/books?id=z3XmCwAAQBAJ&pg=PA20&lpg=PA20&dq=court+institutional+capital+transferable&source=bl&ots=0kC1kjNdWy&sig=G8dFWZ7y87qQm6ptHHdSr1X3ZgQ&hl=en&sa=X&ved=0ahUKEwjGqZHf067aAhUm4YMKHaVEB7QQ6AEIMzAC#v=onepage&q=court%20institutional%20capital%20transferable&f=false)

Choper’s assumption that the judiciary’s institutional capital is transferable from structural cases to individual rights cases is no more credible. Common sense should tell us that the public’s reaction to controversial individual rights cases—for example, cases concerning abortion, school prayer, busing, or criminal defendants’ rights—will be based largely, if not exclusively, on its feelings concerning those particular issues. There exist no grounds to believe that the public’s acceptance or rejection of these individual rights rulings would somehow be affected by anything the court says about wholly unrelated structural issues.

### 2AC---Legitimacy Theory False

**Court legitimacy theory is bunk---support is resilient.**

**Nelson & Tucker 17**, \*Michael J. Nelson, Assistant Professor Department of Political Science Pennsylvania State University; \*Patrick Tucker, Department of Political Science Washington University in St. Louis, “The Stability of the U.S. Supreme Court’s Legitimacy”, (http://mjnelson.org/papers/NelsonTuckerPanel.pdf)

As a result, we simply do not know the extent to which any dips or gains in the Court’s support among individuals survive the passage of more than a handful of months. Given that the Court clusters its most important decisions during the month of June (Epstein, Landes and Posner 2015), it may be the case that what appear to be meaningful changes in the Court’s support revert to an equilibrium level of support by the time the Court’s next term begins (or, under a more generous theory, until the Court decides important cases again the following June). Indeed, were this the case, support for the Court would appear to change in short-term panel surveys or in experimental settings but would actually be relatively stable over time. Because the Court decides most of its important cases in June of each year, panel surveys that encompass only a single year are unable to assess the sort of change that existing theory predicts will erode diffuse support: a number of displeasing decisions, made over a period of time (Easton 1965; Gibson and Caldeira 1992). Indeed, in their pioneering study of the stability of public opinion toward the Court, Mondak and Smithey (1997) suggest that, for even important cases, the window of opportunity for a decision to affect public support for the court is about one month. At that point, support reverts back to its equilibrium level.

Short panels, therefore, can help us understand whether support for the Court shifts in response to a displeasing decision (or set of decisions), but they are unable to examine the persistence of these effects. And it is persistence that is important: if support for the Court tends to revert back to an equilibrium level, as Mondak and Smithey (1997) suggest, then the Court is free to make decisions that anger the American people with relatively impunity. The existence of persistent change in support, however, would suggest that the Court’s legitimacy is more malleable than existing theory suggests; the normative implications of either finding are both obvious and important.

We take up these challenges in this paper, drawing upon the most comprehensive panel data concerning support for the U.S. Supreme Court ever assembled. Tracking attitudes toward the Court 4 measured over 11 waves and four years, our data enable us to test hypotheses about change and stability toward the U.S. Supreme Court that have been beyond the capacity of prior research designs to test. Our analysis thus enables us to address both micro-level and macro-level change in support for the U.S. Supreme Court over a period of time in which the Court’s rulings have been highly salient in American life, including rulings on the constitutionality of health care reform, voting rights, affirmative action, and same-sex marriage. Moreover, we are able to trace the persistence of any shifts in support, thereby providing some of the first evidence about the extent to which displeasing decisions are actually damaging to the Court.

Our analysis reveals a remarkable stability in public support for the Court. Through a period in time in which the Court issued high profile and highly salient rulings on issues as diverse as the constitutionality of the Affordable Care Act, to the federal constitution’s guarantee of marriage to same-sex couples, to the ability of colleges to use race as a criteria in admissions, to the constitutionality of President Obama’s immigration plan, support for the Court was unwavering. Moreover, those changes that did occur were minor and predicted by a single factor: a respondent’s ideology. The results should allay fears that a decline in support has weakened the efficacy of the judiciary and instead suggests that the Court’s support may be even more robust than even the most optimistic previous accounts had suggested.

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### Cap K

#### Even a limited nuclear exchange causes extinction AND turns environment.

Trevithick and Rogoway ’19 [Joseph and Tyler; February 27; Military Analyst, M.A. in Conflict Resolution from Georgetown University, B.A. in the History and Policy of International Relations at Carnegie-Mellon University; Defense Journalist; The Drive, “Yes, India And Pakistan Could End The World As We Know It Through A Nuclear Exchange,” <https://www.thedrive.com/the-war-zone/26674/yes-india-and-pakistan-could-end-the-world-as-we-know-it-through-a-nuclear-exchange>]

A global threat

India and Pakistan's nuclear arsenals are tiny compared to those of the [United States and Russia](http://thedrive.com/the-war-zone/26013/russia-says-its-own-new-weapons-are-exempt-after-accusing-u-s-of-violating-nuclear-arms-deal), and these weapons are focused primarily on deterring each other, but that does not mean they're purely regional threats. Unlike conventional weapons, nuclear weapons create lasting and far-reaching effects that scientists have posited could upend life on Earth if warring parties were to use them in sufficient numbers.

[In 2012](http://climate.envsci.rutgers.edu/pdf/RobockToonSAD.pdf), Alan Robock, a distinguished professor in the Department of Environmental  Sciences and Associate Director of the Center for Environmental Prediction at Rutgers University, and Owen Brian Toon, a professor in the Department of Atmospheric and Oceanic Sciences and a research associate at  the Laboratory for Atmospheric and Space Physics at the University of Colorado, Boulder, argued that it might not take a large amount of nuclear weapons to create a scenario commonly known as "[Nuclear Winter](https://en.wikipedia.org/wiki/Nuclear_winter)."

In general, this hypothesized event occurs when smoke and soot from nuclear explosions block significant amounts of sunlight from reaching the earth's surface, leading to a precipitous drop in temperatures that results in mass crop failure and widespread famine.

Robcock and Toon summarized their findings, which were based in part on their previous work, in an article in the Bulletin of The Atomic Scientists, [writing](http://climate.envsci.rutgers.edu/pdf/RobockToonSAD.pdf):

"Even a 'small' nuclear war between India and Pakistan, with each country detonating 50 Hiroshima-size atom bombs – only about 0.03 percent of the global nuclear arsenal's explosive power – as airbursts in urban areas, could produce so much smoke that temperatures would fall below those of the [Little Ice Age](https://en.wikipedia.org/wiki/Little_Ice_Age) of the fourteenth to nineteenth centuries, shortening the growing season around the world and threatening the global food supply. Furthermore, there would be massive ozone depletion, allowing more ultraviolet radiation to reach Earth's surface. Recent studies predict that agricultural production in parts of the United States and China would decline by about 20 percent for four years, and by 10 percent for a decade.

The bomb the United States dropped on Hiroshima Japan, known as [Little Boy](https://en.wikipedia.org/wiki/Little_Boy), was an inefficient and essentially experimental design with a yield of around 15 kilotons. The reported results from [Indian](https://en.wikipedia.org/wiki/List_of_nuclear_weapons_tests_of_India) and Pakistani nuclear testing indicate that both countries can meet this threshold and both countries' weapons programs have almost certainly matured in the decades since.

In previous studies, Robcock, working with others, postulated that temperature changes could begin within 10 days of a limited nuclear exchange and the effects from the detonations of 100 nuclear weapons in the 15-kiloton class would directly result in the deaths of [at least 20 million people](http://www.nucleardarkness.org/warconsequences/fivemilliontonsofsmoke/). The second order impacts would be even worse in the years that followed.

In 2014, Michael Mills and Julia Lee-Taylor, both then working at the federally-funded National Center for Atmospheric Research's (NCAR) Earth System Laboratory, authored another paper with Robcock and Toon. This [study concluded](https://web.archive.org/web/20140308191334/http:/acd.ucar.edu/~mmills/pubs/2014_EarthsFuture_Mills_et_al.pdf) again that detonation of 100 15-kiloton yield bombs in a purely regional conflict would result in "multi-decadal global cooling" and "would put significant pressures on global food supplies and could trigger a global nuclear famine."

It is important to note that[critics have questioned](https://en.wikipedia.org/wiki/Nuclear_winter#Critical_response_to_the_more_modern_papers) whether the Nuclear Winter concept relies on too many assumptions and would ever actually occur. At the center of many of these rebuttals are debates about whether the nuclear explosions would truly create the amount of smoke and soot necessary for major climate change, as well as the specific conditions for those particles to remain in the atmosphere for a prolonged period of time.

The studies here do indicate significant impacts based on a relatively limited number of nuclear detonations of smaller yield devices, though. But even if the impacts are less pronounced than projected in this particular scenario, they could be far more severe if India and Pakistan were to use a larger number weapons and/or ones of higher yields, which both belligerents readily have.

In addition, Nuclear Winter is just one of the potential things that might happen following a nuclear exchange between the longtime foes. A detonation of dozens of nuclear weapons, even small ones, would throw hazardous nuclear fallout [into the air](http://thedrive.com/the-war-zone/19450/u-s-training-for-arctic-nuclear-satellite-disaster-amid-russian-weapons-developments) that, depending on the weather pattern, could carry that material [far and wide](https://futureoflife.org/background/us-nuclear-targets/?cn-reloaded=1#nukemap), causing both near- and short-term health impacts. The various [ground zeroes](https://nuclearsecrecy.com/nukemap/) themselves would be irritated and potentially hazardous for many years to come.

Depending on where the detonations occur, a nuclear exchange could potentially cut people off from critical water and food supplies, putting increased and potentially unsustainable strains on uncontaminated areas.  After the Chernobyl nuclear power plant, situated in Ukraine, [melted down and exploded](https://en.wikipedia.org/wiki/Chernobyl_disaster) in 1986, authorities established a 1,000 square mile restricted access "[exclusion zone](https://en.wikipedia.org/wiki/Chernobyl_Exclusion_Zone)" that remains in place today.

There would also be a major danger of second-order "spillover" effects, as individuals fled affected areas, putting economic and political strains on neighboring regions. This could inflame existing tensions not directly related to the inter-state conflict between India or Pakistan or lead to all new and potentially violent competition for what might already be limited resources. India has already threatened to [weaponize water access](https://www.nytimes.com/2019/02/21/world/asia/india-pakistan-water-kashmir.html) in its latest spat with the Pakistanis.

Any serious impacts on food and water supplies, or other economic upheavals as a direct or indirect result of the conflict, would have cascading impact across South Asia and beyond, as well. The very threat of a potential India-Pakistan war of any kind already caused [some negative reactions](https://www.cnbc.com/2019/02/27/indian-air-force-plane-crashes-in-kashmir-says-indian-police-official.html) in regional financial markets. Those markets would certainly collapse after an unprecedented nuclear exchange actually occurred, and that is before the long-term physical impacts of such an event would even manifest themselves.

Overall, we are talking about a sudden and dramatic geopolitical, financial, and environmental shift that would change our reality in a matter of hours. Even then, the darkness, both figuratively and literally, that could propagate over the weeks, months, and years would be far more damaging.

How great is the risk?

So far, India and Pakistan have not made any clear indications that the fighting is close to crossing their nuclear thresholds. Pakistan's warnings about the [risks of escalation](http://thedrive.com/the-war-zone/26642/pakistan-promises-retaliation-makes-nuclear-threats-after-indian-jets-bomb-its-territory) seem more calculated to try and prompt India to back down.

India itself has a so-called "no first use" policy, which means it has publicly pledged to use its nuclear weapons only in retaliation to a nuclear strike. However, experts have increasingly called into question whether this is truly the case and whether India might be developing delivery systems more suited to a first strike should there be a need to shift policies.

Pakistan, however, does not have a no first use policy and has insisted on its right to employ nuclear weapons to defend itself even in the face of purely conventional threat. Pakistani officials have, in the past, [specifically cited this policy](https://www.cfr.org/event/promoting-us-pakistan-relations-future-challenges-and-opportunities) as way of deterring India, which has a much larger and in some cases more advanced conventional force, and preventing larger wars.

The concern, then, is that this policy appears to have failed, at least to some degree, with India's strike on undisputed Pakistani territory on Feb. 26, 2019. India, however, did not target Pakistani forces in that instance and exchanges between the two countries have been limited, at least so far, to the disputed Jammu and Kashmir region, where violent skirmishes occur semi-regularly without precipitating a larger confrontation.

We can only hope that the two countries will find a diplomatic solution to this latest conflict and avoid any further escalation. If things were to spiral out of control and lead to the use of nuclear weapons, it would be something that would threaten all of humanity.

#### 3-COVID-19 proves capitalism is financially sustainable---no structural collapse.

Carlsson-Szlezak 20, \*[Philipp Carlsson-Szlezak](https://hbr.org/search?term=philipp%20carlsson-szlezak&search_type=search-all) is a partner and managing director in BCG’s New York office and global chief economist of BCG; \*[Martin Reeves](https://hbr.org/search?term=martin%20reeves&search_type=search-all) is the chairman of Boston Consulting Group’s BCG Henderson Institute in San Francisco and a coauthor of [The Imagination Machine](https://www.amazon.com/Imagination-Machine-Create-Companys-Future/dp/1647820863/ref=sr_1_1?keywords=Martin+Reeves%2C+The+Imagination+Machine&qid=1596553141&s=books&sr=1-1) (Harvard Business Review Press, 2021); \*[Paul Swartz](https://hbr.org/search?term=paul%20swartz&search_type=search-all) is a director and senior economist in the BCG Henderson Institute, based in BCG’s New York office; (“The U.S. Is Not Headed Toward a New Great Depression”, https://hbr.org/2020/05/the-u-s-is-not-headed-toward-a-new-great-depression)

Why the U.S. Is Unlikely to be Headed Towards a Structural Regime Break

Though the path from the crisis we’re in now to either depression or debt crisis is not impossible, it’s not easy or natural, if we examine each of the four paths in regards to the current situation:

Policy Error — The policy challenge of coronavirus is enormous, but what is on display is the opposite of the inaction of the Great Depression. On the monetary side, the first signs of stress in the banking system — in the repo and commercial paper markets — were met with timely and sizable monetary policy action. On the fiscal side, it didn’t take long — certainly by Washington standards — to pass the $2 trillion CARES Act to provide funds to counteract the wave of liquidity and capital problems for the real economy (households and firms). Beyond any specific policy action, we are seeing a mindset in which policy makers will keep throwing policy innovations at the problem until something sticks — quite the opposite of the 1930s.

Political Willingness — It certainly is possible that political calculus gets in the way of averting a structural breakdown, but not very plausible because the political costs are high. To be sure there are two risks involved: 1) The unwillingness to craft a piece of legislation, perhaps because of differences in analysis, beliefs, or dogma; and 2) the failure to pass legislation because one side sees greater political gain in obstruction. While the TARP fiasco reminds us that both risks are real and shouldn’t be dismissed, crises tend to lubricate deal making, and the costs of political obstruction are particularly high, even in a hyper-partisan election year.

Policy Dependence — This path is not applicable in the U.S. because of monetary sovereignty. The Federal Reserve will always facilitate fiscal policy in a time of low and stable inflation and a healthy currency.

Policy Rejection — A debt crisis seems improbable for the U.S.: Inflation expectations are very well anchored (and, if anything, too low). The rate-risk correlation is very solid, where in risk-off periods (moment when investors are less tolerant of risk and prices of risk assets like stocks fall) bond prices rally (yields fall). The USD reserve currency status is deeply entrenched as the rest of the world needs to hold U.S. safe assets (and don’t wish to see their currencies appreciate). And nominal interest rates are generally lower than nominal growth (r – g < 0). All of these factors make for favorable financing conditions. Can coronavirus damage all that and deliver a crisis where markets refuse to purchase U.S. debt? It’s possible, but very implausible, and it would be a long and painful process. A break in the inflation regime plays out over several years.

#### 4-Innovation and profit will increase in the future.

Rotman 16

David, Editor of MIT Technology Review, 4/6/16 (“Tech Slowdown Threatens the American Dream”, <https://www.technologyreview.com/s/601199/tech-slowdown-threatens-the-american-dream/>, Accessed 2/11/19)

While Gordon’s willingness to speculate about what lies ahead is one of the strengths of his book, his blanket skepticism about today’s technologies often sounds unjustified, even arbitrary. He dismisses such digital advances as 3-D printing, artificial intelligence, and driverless cars as having limited potential to affect productivity. More broadly, he ignores the potential impact of recent breakthroughs in gene editing, nanotechnology, neurotechnology, and other areas.

You don’t have to be a techno optimist to think that radical and potentially life-changing technologies are not a thing of the past. In “Is Innovation Over?” Tyler Cowen acknowledges the “stagnation in technological progress” but concludes there are ample reasons to be hopeful about the future. Cowen told me: “There are more people working in science than ever before, more science than ever before. In [artificial intelligence], biotechnology, and [treatments] for mental illnesses, you could see big advances. I’m not saying it is going to happen tomorrow—it may be 15 to 20 years from now. But how could you possibly know it won’t happen?”

In some ways, Gordon’s book is a useful counter to the popular view that we’re in the midst of a technology revolution, says Daron Acemoglu, an economist at MIT. “It’s a healthy debate,” he says. “The techno optimists have had too much of a run without being challenged.” Yet, says Acemoglu, it’s hard to accept Gordon’s argument that we’re seeing a slowdown in innovation: “It may well be that these innovations haven’t translated into productivity. But if you look at just the technologies that have been [recently] invented and are close to being implemented over the next five to 10 years, they are amazingly rich. It is just very hard to think we’re in an age of paucity of innovation.” And, says Acemoglu, “to project even further into the future that we’re not going to translate these innovations into productivity growth is not an easy argument to make.”

#### 5---Growth solves resources and other planetary boundaries outside of warming.

Bailey ’19 (Ronald; science correspondent for Reason magazine, member of the Society of Environmental Journalists and the American Society for Bioethics and Humanities, writer of multiple books, formerly wrote for Forbes, and testified in front of Congress; April 22nd; “5 Environmental and Human Trends Worth Celebrating This Earth Day”; <https://reason.com/2019/04/22/five-environmental-and-human-trends-worth-celebrating-this-earth-day/>; accessed 7/18/19; MSCOTT)

To celebrate the 49th Earth Day, below are some global trends indicate that the state of humanity and the natural world is on course to dramatically improve by the end of this century.

Peak Population: The world population will likely peak at 9.8 billion people at around 2080 and fall to 9.5 billion by 2100 in the medium fertility scenario calculated by demographer Wolfgang Lutz and his colleagues at the International Institute of Applied Systems Analysis.

Alternatively, assuming rapid economic growth, technological advancement, and rising levels of educational attainment for both sexes—all factors that tend to lower fertility—Lutz projects that world population will more likely peak at around 8.9 billion by 2060 and decline to 7.8 billion by the end of the 21st century. Global population stands at about 7.7 billion now.

Other global trends such as steeply falling child mortality rates, increased urbanization, rising incomes, and the spread of political and economic freedom all strongly correlate with families choosing to have fewer children. Instead of having many children in the hope that a few might survive, more parents around the world now at aim at providing those few that they do have with the skills and social capital that will enable them to flourish in a modern economy.

Forest Expansion: Global tree canopy cover increased by 2.24 million square kilometers (865,000 square miles) between 1982 and 2016, reported researchers at the University of Maryland in a September 2018 study in ​Nature​.

Using satellite data to track the changes in various land covers, they found that gains in forest area in the temperate, subtropical, and boreal climatic zones are offsetting declines in the tropics.

Tree canopy in Europe, including European Russia, has increased by 35 percent—the greatest gain among all continents. The researchers attribute much of that increase to the "natural afforestation on abandoned agricultural land," which has been "a common process in Eastern Europe after the collapse of the Soviet Union." The tree canopy in the U.S. and China has increased by 34 and 15 percent respectively.

Simon Resource Abundance Index: Data for 50 foundational commodities covering energy, food, materials, and metals was collected by the World Bank and the International Monetary Fund between 1980 and 2017. Adjusted for inflation, the prices for 43 commodities declined, two remained equally valuable, and five commodities increased in price. On average, the real price of 50 commodities fell by 36.3 percent.

Between 1980 and 2017, the inflation-adjusted global hourly income per person grew by 80.1 percent. Therefore, in terms of the amount of work required, commodities became 64.7 percent cheaper. Put differently, commodities that took 60 minutes of work to buy in 1980, took only 21 minutes of work to buy in 2017.

U.S. Air Pollution Trends: The Environmental Protection Agency reports that between 1980 and 2017, U.S. gross domestic product increased 165 percent, vehicle miles traveled increased 110 percent, energy consumption increased by 25 percent, and U.S. population grew by 44 percent. During the same period, emissions of carbon monoxide fell by 72 percent; lead by 99 percent; nitrogen oxides by 61 percent; compounds from automobile exhaust associated with ozone by 54 percent; sulfur dioxide by 89 percent, and particulates by 61 percent. During the same time period, total emissions of the six principal air pollutants dropped by 67 percent.

Peak Farmland: Global arable land (annual crops like wheat and corn) and permanent crops (such as coffee and cocoa) were planted on 1,371 million hectares in 1961. That rose to 1,533 million hectares in 2009. Rockefeller University researcher Jesse Ausubel and his co-authors project a return to 1,385 million hectares in 2060, thus restoring at least 146 million hectares to nature. This is an area two and a half times that of France or the size of ten Iowas. While cropland has continued to expand slowly since 2009, the World Bank reports that land devoted to agriculture (including pastures) peaked in 2000 at 4,918 million hectares and had fallen to 4,862 million hectares by 2015. This human withdrawal from the landscape is the likely prelude to a vast ecological restoration over the course of this century.

#### A centralized, planned-economy is structurally unable to mimic the social and economic environment that cultivates innovation.

Guo et al. 20, \*Di Guo, Business School, Brunel University London; \*Haizhou Huang, China International Capital Corporation; \*Kun Jiang, Business School, University of Nottingham; \*Cheung Kong, Graduate School of Business, Oriental Plaza; (September 14th, 2020, “Disruptive innovation and R&D ownership structures”, https://doi.org/10.1007/s11127-020-00850-1)

However, history shows that socialism is not good at disruptive innovation (Kornai 2013). Compared with capitalist economies, why are socialist economies unable to invent revolutionary products? In addressing that question, Kornai examines the characteristics of the innovation process in capitalist and socialist economies (Table 1). Factors (A), (C), (D) and (E) in Table 1 are related to competition and conflicts between winners and losers in that process, which are substantially different when they have hard budget constraints (HBCs) in capitalism and SBCs in socialism. An HBC is a critical factor in fostering disruptive innovations, and this factor is the foundation of the Schumpeterian creatively destructive process. As Kornai (2013, p. 34) notes, “[T]he Schumpeterian process of innovation ... has inevitably two sides: many projects are needed for the few great successes, and at the same time, we get too many of them”.

The upside is the creation of new products. The downside is that destruction implies the bankruptcy of old firms (HBC) and the “extinction” of old products. That disadvantage is an essential part of the Schumpeterian process and necessary for innovation and vibrant market mechanisms. However, only capitalism supports HBCs (Kornai et al. 2003), which provide conditions for investing in promising projects and rewarding successful entrepreneurs (Kornai 2013, p. 15). By contrast, in socialism with SBCs, loss-making firms are protected from going bankrupt, and innovation proceeds through a bureaucratic planning mechanism. Consequently, investment in R&D is confined to a small number of politically favored projects, and the rewards for success are inadequate (Kornai 2013, p. 15).