## 1AC – Wake

### Innovation Adv

#### Advantage One: Innovation

#### Parker immunity discourages disruptive healthcare innovation

Sage 17 (William Sage, James R. Dougherty Chair for Faculty Excellence in the School of Law and Professor of Surgery and Perioperative Care in the Dell Medical School, University of Texas at Austin; and David Hyman Professor at Georgetown University School of Law, “Antitrust as Disruptive Innovation in Health Care: Can Limiting State Action Immunity Help Save a Trillion Dollars?” Loyola University Chicago Law Journal, Pages 731-734, modified for ableist language indicated by strikethrough and [brackets]) MULCH

Physicians possess this power for a simple reason: the body of doctrines and practices that we call “health law” systematically supports it. Laws protect the public from individuals and therapies not controlled by physicians, and discourage medical self-help. Laws fund physicians’ tools and assure their quality—though unfortunately not their value. Laws mandate and subsidize insurance coverage for the treatments physicians recommend. Laws insulate physicians from corporate structures and contractual norms. Laws mediate disputes between physicians and patients based on professional standards. Laws apply medical criteria to most ethical issues. Finally, laws such as those challenged in North Carolina State Board delegate substantial rule making and disciplinary authority to state licensing boards (i.e., to entities populated from, and controlled by, the medical profession). States typically justify this abdication of direct oversight in terms of physicians’ scientific expertise, and their ethical duty to heal, not harm, patients.

Both individually and collectively, these laws profoundly distort competition in health care and severely hamper the market’s ability to generate the benefits of competition that we see in other industries. Production remains fragmented. Prices are both inflated and arbitrary— and price competition is minimal (when it even exists at all). There are many barriers to competitive entry—even to deliver the most basic services. Geographic markets are needlessly small and are surprisingly concentrated. Supply bottlenecks are common, often to the mutual benefit of large health insurers and dominant health care providers. And innovation is limited to the sorts of inputs that fit into existing production processes—mainly drugs, diagnostics, and medical devices.

The result is that our health care system almost never trades in the types of consumer products that dominate other costly, complex, technologically sophisticated industries. Instead of fully assembled products accompanied by a strong performance warranty, patients are expected to pay for disaggregated professional process steps (including procedures and consultations) to which billing codes have been assigned, and for equally atomized inputs and complements to those professional processes (such as diagnostic tests and surgical supplies). Health insurance agglomerates these unstructured procedural steps and physical inputs into “covered benefits,” but it does not assemble them into actual, useful products—and only a few true Health Maintenance Organizations (“HMOs”) provide comprehensive prepaid care.

The past decade has witnessed growing agreement regarding both the necessary attributes of a high-performing health care system,17 and the managerial strategies for achieving them.18 Much less attention has been paid to the legal obstacles that have long hindered attempts to redesign acute and complex care—let alone to moving the locus of basic care “upstream,” where it can be communally or self-administered, rather than professionally controlled. As currently constituted, American health law presents concrete structural impediments to accomplishing these consensus health policy goals, and also creates opportunities for incumbent providers to delay or sabotage such efforts.

C. Anticompetitive Effects of Medical Licensing The deep legal architecture of health care strongly favors physician self-regulation, and furthers physicians’ professional insularity and self interest. Physician-controlled medical licensing boards have attracted criticism for decades. Milton Friedman famously wrote in 1962: I am . . . persuaded that [restrictive] licensure has reduced both the quantity and quality of medical practice; . . . that it has forced the public to pay more for less satisfactory medical service[;] and that it has ~~retarded~~ [slowed] technological development both in medicine itself and in the organization of medical practice.19

At the time he made it, Friedman’s harsh economic critique of occupational licensing was not widely shared (except among other libertarians). Professional elites were thought to represent a progressive, prosperous alternative to industrial commodification and the supposed exploitation of labor. To be sure, there was some recognition that the professions might use ethical codes to pursue their own economic selfinterest.20 But mainstream economists such as Kenneth Arrow still believed that collective professionalism improved the marketability of health care by fostering the trust needed to overcome medical uncertainty and informational asymmetry between physicians and patients.21 More recently, a wide array of voices have questioned the economics, and even the justice, of professional privilege.22 In 2015, the Obama Administration issued a report on occupational licensing, finding that “licensing can . . . reduce employment opportunities and lower wages for excluded workers, and increase costs for consumers,” and that “the costs of licensing fall disproportionately on certain populations.”23

To be sure, medical licensing laws are not solely to blame for health care’s competitive shortcomings. Other federal and state regulations and subsidies bear responsibility as well. Still, licensing boards set the tone for the rest of health law as gatekeepers into the health professions and arbiters of practice once admitted. These boards determine the permitted scope of practice, confer authority to write prescriptions, police departures from conventional patterns of care, respond to complaints by licensees about outsiders, and decide when (and, usually, when not) to take disciplinary action against a licensed professional.

From a health policy perspective, physician-imposed barriers to market entry and innovation—typically enforced by a professional licensing board—are the most pernicious practice. Licensing boards set standards for acceptability and impose discipline on licensees who violate their dictates. Unlicensed practice is a criminal act. These entry barriers not only deter novel approaches from new directions, such as telehealth and various “upstream” self-care modalities, but they also discourage existing competitors from adopting practices introduced to the market by disruptive innovators.

#### Disruptive innovation in healthcare solves pandemics

Shaikh 15 (Affan T. Shaikh, Professor at Emory’s school of public health Lisa Ferland, Robert Hood-Cree, Loren Shaffer, and Scott J. N. McNabb, September 23rd 2015, “Disruptive Innovation Can Prevent the Next Pandemic” NCBI <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4585064/>) MULCH

Public health surveillance (PHS) is at a tipping point, where the application of novel processes, technologies, and tools promise to vastly improve efficiency and effectiveness. Yet twentieth century, entrenched ideology and lack of training results in slow uptake and resistance to change. The term disruptive innovation – used to describe advances in technology and processes that change existing markets – is useful to describe the transformation of PHS. Past disruptive innovations used in PHS, such as distance learning, the smart phone, and field-based laboratory testing have outpaced older services, practices, and technologies used in the traditional classroom, governmental offices, and personal communication, respectively. Arguably, the greatest of these is the Internet – an infrastructural innovation that continues to enable exponential benefits in seemingly limitless ways. Considering the Global Health Security Agenda and facing emerging and reemerging infectious disease threats, evolving environmental and behavioral risks, and ever changing epidemiologic trends, PHS must transform. Embracing disruptive innovation in the structures and processes of PHS can be unpredictable. However, it is necessary to strengthen and unlock the potential to prevent, detect, and respond.

Introduction

Fifty-two years ago, Alexander Langmuir articulated our modern understanding of public health surveillance (PHS) – the systematic collection, consolidation and evaluation, and dissemination of data (1). In this workflow process, public health provides epidemiologic intelligence to assess and track conditions of public health importance, define public health priorities, evaluate programs, and conduct public health research (2). However, amid this rapidly changing world, PHS has remained sluggish and hindered by the impediments of siloed, vertical (outcome-specific) systems, inadequate training and technical expertise, different information and communication technology (ICT) standards, concerns over data sharing and confidentiality, poor interoperability, and inadequate analytical approaches and tools (3–7).

Gaps and impediments in PHS have become increasingly evident to the world in the wake of the largest Ebola epidemic ever – in which these challenges impacted our ability to prevent, detect, and respond. Under the looming threat of MERS-CoV, leishmaniasis, influenza, multidrug-resistant tuberculosis, and plague, the global public health community now realizes the urgent need to address shortcomings in PHS. Properly preparing for the next major outbreak hinges on our willingness to transform; the consequences of not doing so are dire.

Transforming PHS to meet the needs of the twenty-first century requires novel approaches. A helpful concept to understand and chart this future is disruptive innovation – a term first introduced by Clayton Christensen to describe innovations in technology and processes that disrupt existing markets (8). Disruptive innovations occur when advances in technologies or processes create markets in existing industries. This differs from sustaining innovations, where existing practices are incrementally improved to meet the demands of existing customers; in contrast, newly introduced innovations with disruptive potential (typically unrefined, simple, and affordable in character) target lower-end market needs or create entirely new market segments. As sustaining innovations improve disrupting technologies or processes, these new innovations will meet increasingly greater needs, capture greater market share, and eventually reshape the industry. Christensen uses the example of increasingly smaller disk sizes in the hard disk drive industry, the introduction of hydraulic technology in the mechanical excavator industry, and the rise of minimills in the steel industry to demonstrate the impact of disruptive innovations (8). Here, we describe the need for disruptive innovation in PHS and identify opportunities for disruption in PHS structures and processes.

#### Capacity for innovation solves invisible thresholds for existential pandemics – they’re coming now – new 400 year study + statistical methods

Penn 21 (Michael Penn, Director of Communications, Marketing and Alumni Relations, Duke Global Health Initiative, citing William Pan, Ph.D., associate professor of global environmental health at Duke, Marco Marani, adjunct professor at Duke department of Global Health, where he previously was a professor of civil and environmental engineering and Anthony Parolari, Ph.D., of Marquette University, is a former Duke postdoctoral researcher, Gabriel Katul, Ph.D., the Theodore S. Coile Distinguished Professor of Hydrology and Micrometeorology at Duke, “Statistics Say Large Pandemics Are More Likely Than We Thought” Duke Global Health Institute, <https://globalhealth.duke.edu/news/statistics-say-large-pandemics-are-more-likely-we-thought>) CULTIV8

The COVID-19 pandemic may be the deadliest viral outbreak the world has seen in more than a century. But statistically, such extreme events aren’t as rare as we may think, asserts a new analysis of novel disease outbreaks over the past 400 years.

The study, appearing in the Proceedings of the National Academy of Sciences the week of Aug. 23, used a newly assembled record of past outbreaks to estimate the intensity of those events and the yearly probability of them recurring.

It found the probability of a pandemic with similar impact to COVID-19 is about 2% in any year, meaning that someone born in the year 2000 would have about a 38% chance of experiencing one by now. And that probability is only growing, which the authors say highlights the need to adjust perceptions of pandemic risks and expectations for preparedness.

“The most important takeaway is that large pandemics like COVID-19 and the Spanish flu are relatively likely,” said William Pan, Ph.D., associate professor of global environmental health at Duke and one of the paper’s co-authors. Understanding that pandemics aren’t so rare should raise the priority of efforts to prevent and control them in the future, he said.

The study, led by Marco Marani, Ph.D., of the University of Padua in Italy, used new statistical methods to measure the scale and frequency of disease outbreaks for which there was no immediate medical intervention over the past four centuries. Their analysis, which covered a murderer’s row of pathogens including plague, smallpox, cholera, typhus and novel influenza viruses, found considerable variability in the rate at which pandemics have occurred in the past. But they also identified patterns that allowed them to describe the probabilities of similar-scale events happening again.

In the case of the deadliest pandemic in modern history – the Spanish flu, which killed more than 30 million people between 1918 and 1920 -- the probability of a pandemic of similar magnitude occurring ranged from 0.3% to 1.9% per year over the time period studied. Taken another way, those figures mean it is statistically likely that a pandemic of such extreme scale would occur within the next 400 years.

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But the data also show the risk of intense outbreaks is growing rapidly. Based on the increasing rate at which novel pathogens such as SARS-CoV-2 have broken loose in human populations in the past 50 years, the study estimates that the probability of novel disease outbreaks will likely grow three-fold in the next few decades.

Using this increased risk factor, the researchers estimate that a pandemic similar in scale to COVID-19 is likely within a span of 59 years, a result they write is “much lower than intuitively expected.” Although not included in the PNAS paper, they also calculated the probability of a pandemic capable of eliminating all human life, finding it statistically likely within the next 12,000 years.

That is not to say we can count on a 59-year reprieve from a COVID-like pandemic, nor that we’re off the hook for a calamity on the scale of the Spanish flu for another 300 years. Such events are equally probable in any year during the span, said Gabriel Katul, Ph.D., the Theodore S. Coile Distinguished Professor of Hydrology and Micrometeorology at Duke and another of the paper’s authors.

“When a 100-year flood occurs today, one may erroneously presume that one can afford to wait another 100 years before experiencing another such event,” Katul says. “This impression is false. One can get another 100-year flood the next year.”

As an environmental health scientist, Pan can speculate on the reasons outbreaks are becoming more frequent, noting that population growth, changes in food systems, environmental degradation and more frequent contact between humans and disease-harboring animals all may be significant factors. He emphasizes the statistical analysis sought only to characterize the risks, not to explain what is driving them.

But at the same time, he hopes the study will spark deeper exploration of the factors that may be making devastating pandemics more likely – and how to counteract them.

“This points to the importance of early response to disease outbreaks and building capacity for pandemic surveillance at the local and global scales, as well as for setting a research agenda for understanding why large outbreaks are becoming more common,” Pan said.

#### **Health innovation solves ABR – kills 10 million people per year, more market access is key**

McMurry-Heath 9/16 (Michelle McMurry-Heath is president and CEO of the Biotechnology Innovation Organization, and lives in Washington, D.C. Tomaras is chief scientific officer at Forge Therapeutics, and lives in San Diego, September 16th 2021, “Opinion: Antibiotic-resistant superbugs are a ticking time bomb in global health care” San Diego Union Tribune, <https://www.sandiegouniontribune.com/opinion/commentary/story/2021-09-16/superbug-drugs-therapy-antibiotics>) MULCH

The global health-care system faces a ticking time bomb.

Deadly bacteria and fungi are evolving to resist all current antimicrobials. If that happens, everything from chemotherapy to routine surgeries will become extraordinarily risky, since patients’ weakened immune systems won’t be able to fight off these dangerous infections, and existing medicines will be of little use. The United Nations estimates that without new antibiotics, by 2050, superbugs could kill 10 million people a year.

We don’t know exactly when our last antibiotics will lose their efficacy. We don’t know which strain of “superbug” will push us past the tipping point. But we do know that America’s small biotechnology firms house some of the brain power to avert this disaster.

These firms and their scientists — many based here in California — are battling hard against this microscopic enemy. But small biotechnology firms are not just fighting microbial evolution; they are also grappling with a broken antibiotics market whose inefficiencies are putting millions of lives at risk.

Antibiotics are expensive to develop, costing upwards of $1 billion per new medicine. But doctors only prescribe advanced new antibiotics sparingly — because every dose gives bacteria a chance to evolve and become resistant. And most patients only need antibiotics for a few days, unlike insulin or statins, which many chronic disease patients need to take every day for years or even decades.

Because of the high research and development costs and low probability of earning a financial return on antibiotics, many large pharmaceutical companies have pivoted away from antibiotics development. Since the 1980s, the number of major drug companies developing new antibiotics has fallen from 18 to three.

#### Antibiotic resistant superbugs and zoonotic viruses are catastrophic risks that guarantee extinction.

Victor 20 — Gavin Victor, Pioneer Journalist and Philosophy Research Assistant for Whitman College, 2020 (“Forget coronavirus: Worry about antibiotic resistance instead,” *Whitman Wire*, March 12th, Available Online at https://whitmanwire.com/opinion/2020/03/12/forget-coronavirus-worry-about-antibiotic-resistance-instead/, Accessed 07-02-2021)

A survey of experts from the “Future of Humanity Institute” at the University of Oxford states that there is a 19 percent chance of human extinction before 2100. If this is the risk of our extinction, then consequently, an extreme decrease in quality of life is much more likely, too. Among the many risks within contemporary life, issues surrounding antibiotic resistance are almost completely unacknowledged, incredibly dangerous and subject to change with only slight cultural and industrial shifts. The WHO claims that, “without urgent action, we are heading towards a post-antibiotic era, in which common infections and minor illnesses can once again kill.” The UN claims that by 2050, ten million people will die every year from antibiotic-resistant diseases – which is more than the current figure for cancer.

Antibiotic resistance stems from the misuse of antibiotics. The more we use antibiotics, the more we allow bacteria to build up a tolerance to them. We have already seen the advent of MRSA and antibiotic-resistant salmonella. The most obvious fix for this is to only prescribe antibiotics when absolutely necessary, which doctors are beginning to do. Humans, however, only use 20 percent of the antibiotics manufactured. The rest are consumed constantly by animals waiting for slaughter in massive feeding operations. Lance Price, an expert on bacteria resistant “superbugs”, claims that our food system’s predication on a constant use of antibiotics for animals is a recipe for disaster, because it uses antibiotics in a way that will inevitably lead to antibiotic resistance.

As with almost all recent disease outbreaks – like Swine-flu, MERS and SARS – COVID-19 is zoonotic, meaning that it originated in animals. Not only did these diseases originate in animals but in a particular species of animals that inhabit unnatural conditions for the sake of humans: including Swine-flu from pigs, MERS from camels, as well as SARS and COVID-19 likely originating from bats. While viruses are not the same problem as is antibiotic resistance, overlap between them indicates that top priority global health issues are stemming from our failure to have a healthy relationship with animals. We get zoonotic diseases as a result of exploitative and unnatural relationships with animals.

We need to use the fear generated by COVID-19 to jump start legitimate action in order to mitigate the fallout from catastrophes right around the corner. The fact that we turn a blind eye to pandemics that are becoming more and more inevitable is a sign that we shouldn’t trust our natural tendency to just “deal with it later.” Dealing with it later, dealing with the pandemics that are coming, doesn’t work. We should be scared – but of much more than COVID-19.

#### Narrowing Parker immunity empowers the FTC to challenge anticompetitive business sanctioned by state regulatory schemes. Those stifle innovation – incumbent regulations are outdated and block new entrants.

Crane 19 [Daniel A. Crane, Frederick Paul Furth Sr. Professor of Law, University of Michigan, 60 Wm. & Mary L. Rev. 1175, 2019, Lexis]

INTRODUCTION

This Article's intended audience holds a common view that state and local governments frequently adopt anticompetitive regulations for the benefit of economic special interests and that these acts of cronyism are pernicious to democracy, consumers, and economic efficiency. 1 In other words, the costs to society of these regulations far outweigh any reasonable benefits. A wise, beneficent, and all-knowing Platonic guardian of the state would have little trouble in striking down such regulations.

A further point of general consensus might relate to the particularly pernicious effect of anticompetitive state and local regulation in stifling new production innovation. In a variety of ways, our constitutional order is stodgy. Its conservatism lends a hand to the beneficiaries of incumbent technologies as they seek to deploy state power to block or to slow the advent of new technologies that may eventually displace the old, thereby preventing a realignment of wealth and position. In recent years, innovative technologies developed by companies such as Tesla, Uber, Lyft, and Airbnb have encountered determined opposition from purveyors of predecessor technologies, who have often used state and local regulation to thwart innovation. 2

So much for the common ground. Where consensus quickly fragments is on the question of what, if anything, to do about such regulations given that wise, beneficent, and all-knowing Platonic guardians of the state are in short supply. In the imperfect messiness that is liberal democracy, we frequently accept a host of comparatively petty inconveniences--political and economic--in order to preserve larger values. Just as we tolerate many market failures because the attempt at a regulatory fix might aggravate matters, we may have to tolerate some political failures on the same grounds.

[\*1178] Much of the difficulty has to do with the fact that while there might be a broad consensus that state and local governments enact many unjustifiable anticompetitive regulations, there is not a clear consensus on which ones they are. The experience with economic substantive due process in the late nineteenth and early twentieth centuries, epitomized in Lochner v. New York, 3 has left the American political psyche gun-shy about permitting judges to strike down protectionist economic regulations on constitutional grounds. Shortly after getting out of the Lochner business, the Supreme Court announced that it would not get into the same business under the guise of the antitrust laws. 4 Over time, the development of the Parker state action doctrine allowed the courts to play a somewhat expanded role with respect to anticompetitive state and local regulations, but the zone of judicial review remains relatively constricted. 5

The purpose of this Article is to compare the deployment of constitutional and antitrust tools to scrutinize potentially anticompetitive state and local regulations against the backdrop of the ubiquitous concern about "Lochnerizing" under the auspices of either constitutional or statutory authority. Here is the question in a nutshell: If one believes that courts (or perhaps federal administrative agencies) should do somewhat more than they currently do to scrutinize and potentially invalidate anticompetitive state and local regulations, which lever should they pull--constitutional doctrines, antitrust preemption, or both? Because there are some overlapping, and some separate, institutional constraints and potential pathologies between constitutional and antitrust law, it is important to compare the two tools before deploying them.

This Article is organized as follows: Part I diagnoses the underlying features of democratic government that produce anticompetitive regulation. Some of this story is quite familiar, but I present some new observations with respect to the role of technological incumbency as a strong factor in invoking regulation to thwart innovation.

[\*1179] Part II explores the historical, ideological, and institutional foundations of the current legal doctrines with respect to constitutional and antitrust scrutiny of anticompetitive regulations. It shows that, despite the narrowing of Parker immunity in recent decades and some recent revival of equal protection and substantive due process as constraints on anticompetitive regulation, a good deal of anticompetitive state and local regulation remains impervious to legal challenge.

Part III compares the potential efficacy and pitfalls of deploying constitutional or antitrust doctrines as checks on anticompetitive state and local regulations. It considers: (1) the reach and domain of constitutional and antitrust theories; (2) the ways in which each theory could accommodate genuine and sufficient justifications for the challenged regulations; (3) ways in which the antitrust and constitutional tools differ substantively and procedurally; and (4) ways in which the two theories might interact.

I. WHY ANTICOMPETITIVE REGULATION SUCCEEDS

This Article opened with the assumption that a wide universe of unjustified state and local anticompetitive regulation exists that a benevolent Platonic guardian of the state would instantly nullify. Given this conceit, the presence of such regulations necessarily represents democratic failures, as democracy should, in principle, strive for laws that confer positive, rather than negative, public benefit. What, then, accounts for the pervasive existence of these undesirable regulations? The answer comes in two parts--a generic (and largely familiar) story concerning anticompetitive regulations as a whole, and a more specific story concerning the battle between incumbent and innovative technologies.

A. The Generic Story

The generic story is largely familiar from public choice theory and the literature on the Parker state action doctrine. Democratic processes systematically fail to overcome two embedded hurdles to matching regulatory schemes to broad public preferences: (1) the asymmetrical distribution of costs and benefits of anticompetitive [\*1180] regulations, and (2) the externalization of costs on populations outside the boundaries of the relevant democratic unit. 6 In tandem, these hurdles to democratic correction of cronyistic dispensations of monopoly power by governmental regulators perpetuate regulatory schemes that a broad majority of citizens would vote to overturn if they understood the issue and were sufficiently motivated to invest political energy in correcting it. 7 The first democratic deficit, well documented in public choice literature, arises because producers typically receive a much more concentrated benefit from anticompetitive regulations in comparison to the relatively unconcentrated cost imposed on consumers. 8 A small band of producers may lobby aggressively to enact or maintain an anticompetitive scheme that permits the producers to collect significant monopoly rents. 9 Those rents, in turn, may be spread across thousands or millions of consumers, each one paying a relatively small increase in rent. 10 Collective action constraints--the cost of mobilizing consumer sentiment and action to oppose the regulation--give the producers a systematic advantage in maintaining the regulation. 11 As John Shepard Wiley explained in bringing public choice theory literature to bear on Parker immunity questions: [I]f the group [of consumers] is large, individual members have little incentive to participate because participation is personally costly and contributes little to the group's chances for successful joint action. Small groups encounter fewer of such problems. If group members behave in this rational self-interested manner, then "there is a systematic tendency for exploitation of the great by the small"; less numerous, more intensely concerned special [\*1181] interests can predictably outmatch more numerous, more mildly concerned consumer or "public" interests in legislative or regulatory fora--even though the actions of special interests impose a net loss on society. 12 The second deficit arises when governmental units--whether state or local--externalize the costs of the anticompetitive regulation outside their jurisdiction. The classic example is Parker itself, in which 90 percent of the raisins subject to California's agricultural cartel mandate were sold outside of California. 13 Out-of-state consumers could not be counted on to mobilize democratically to oppose the California regulation, as they had no political voice in California. 14 Many similar examples of jurisdictional cost externalization have been documented. 15 One arose in an important Supreme Court decision on state action immunity, Town of Hallie v. City of Eau Claire. 16 Hallie, Seymour, Union, and Washington were unincorporated towns adjacent to the city of Eau Claire, Wisconsin. 17 Their citizens could not vote in Eau Claire, but Eau Claire wanted to annex those territories into its boundaries, possibly through coercive means. 18 Eau Claire received federal funds to build a sewage treatment plant in its service area, which covered the four towns, then refused to supply sewage treatment services to the towns. 19 However, the city did agree to provide treatment services to certain homeowners in the towns if a majority of area voters voted by referendum to allow Eau Claire to annex their homes and to commit to use Eau Claire's sewage and transportation services. 20 The towns claimed this scheme was designed to keep the other towns from effectively competing with Eau Claire's sewage collection and transportation services. 21 The scheme also possibly allowed the [\*1182] city to raise costs for nonresidents while at the same time leveraging the higher prices to bring the nonresidents (and presumably their property taxes) into the city. 22 Although the city's motivation was ultimately political rather than narrowly economic, it used an anticompetitive strategy to dump monopoly costs on nonresidents who could not vote to rescind the regulations until they joined the city, at which point the question would be moot. 23 Together, these two deficits--asymmetrical costs and benefits to both producers and consumers and cost externalization--explain why democratic processes often fail to weed out anticompetitive regulations. Without concerted efforts by champions of consumer interests to overcome collective action problems and mobilize support for regulatory reform, the regulatory barriers to competition can linger indefinitely. As discussed next, these failures of democratic self-correction are exacerbated by regulations that entrench incumbent technologies at the expense of innovation.

B. Additional Considerations Affecting Product Market Innovation

Many of the contemporary regulatory battles between old and new technologies (particularly those involving the sharing economy) can be understood as follows. The incumbent regulatory scheme arose many decades ago and may well have been legitimately justified (in the sense of not imposing more costs than benefits) at the time of its adoption. 24 Our hypothesized Platonic guardian might even have approved of it at the time of its adoption. 25 The passage of time and advent of new technologies has now eroded the original basis of the regulation, and our Platonic guardian would therefore want the regulation rescinded or reformed. However, incumbent firms succeed in blocking or slowing innovative competition by circling the wagons around the incumbent regulatory schemes. 26 In [\*1183] these wars, the incumbents have a decisive advantage for at least three structural reasons.

First, if the incumbent regulatory scheme has allowed the incumbent firms to collect monopoly rents, then there may be a sharp asymmetry of incentives between old and new firms. 27 This is the same asymmetry that attends any struggle between incumbent monopolists and new competitive entrants: the monopolist is seeking to protect a large market share at a monopoly price, whereas the new entrant can only hope to gain a smaller market share at a competitive price. 28 Because the incumbent has more to gain than the new entrant has to lose, the incumbent will be willing to spend more to entrench the regulatory monopoly than the new entrant will be to challenge it. 29 This, in turn, discourages potential new entrants from investing in innovative new technologies and mounting political and market-oriented challenges to the incumbents. 30

Second, the incumbents have the advantage of status quo biases and fears about the consequences of technological change. 31 Costs of the existing system--to human safety, for example--may be seen as an inevitable baseline, whereas potential risks from the new technology may be seen as incremental threats. 32 Hence, risks and costs of the existing system may be undercounted or not counted at all, while risks and costs of the new system will be made to bear the full weight of their risks and costs.

For example, in recent months there have been widely reported stories of Uber drivers sexually abusing passengers. 33 These stories rarely report the base rate of abuse by taxi drivers or public transit [\*1184] workers, who might well present similar risks to passengers. 34 Similarly, the news media seem to wait with bated breath to report every accident involving a driverless vehicle 35 --even ones where the vehicle was stationary and hit by another at-fault vehicle--without reporting the base rate of nearly 40,000 deaths a year from human-driven vehicles. 36 The focus of news reporting seems to be on the incremental risks created by automated driving without regard to the baseline number of deaths that automated driving might diminish. 37 In principle, regulators should compare the likely risks of allowing new technologies to those of perpetuating the incumbent technology, but they often default to some version of the precautionary principle, insisting that new technologies prove their safety and efficacy in an absolute rather than comparative sense. 38 Given this baseline asymmetry, proponents of new technologies frequently must overcome significant regulatory hurdles not faced by incumbent technologies. Or, incumbent technologies may persuade regulators to force new technologies to play by rules that favor the incumbent technologies--a form of raising rivals' costs and creating regulatory entry barriers. 39

Finally, incumbents enjoy the generic benefits of incumbency in a structurally conservative constitutional and political system. The multiple "veto gates" to reform legislation--structural factors such as bicameralism, presentment, filibusters, and committee structures 40 --empower technological incumbents to ride the status quo for years or decades after our hypothetical Platonic guardian would have instituted public-minded reforms. 41

[\*1185] In combination, these three factors create additional barriers to the expected flow of democratic processes toward majoritarian equilibria--that is to say, equilibria that favor consumers' interests in competition and innovation over those of producers in capturing monopoly rents. In light of these factors and the collective action and cost externalization factors discussed earlier, 42 it is unsurprising that regulation serves as a barrier to innovation.

C. An Illustration from Automobile Distribution

The ongoing story of Tesla's efforts to break into the American automobile market illustrates the stickiness of incumbent regulations. 43 For a variety of business reasons, when Tesla entered the market in 2012, it decided that it would have to sell its all-electric vehicles (EVs) directly to consumers, meaning that it would have to open its own showrooms and service centers rather than outsourcing that function to franchised dealers. 44 Among other things, Tesla believed that traditional dealerships would be reluctant and ill-positioned to sell EVs and that Tesla therefore could not expect to convince already skeptical customers to buy EVs unless it opened its own retail facilities. 45 Since the mid-twentieth century, however, most states have adopted laws intended to protect dealers from unfair exploitation by manufacturers. 46 Among the provisions in many of these state statutes is a prohibition on a manufacturer opening its own showrooms and service centers. 47 In many states, manufacturers are required to distribute through independent dealers only. 48

Legislatures adopted these direct distribution prohibitions at a time when American car manufacturing was dominated by the "Big Three" (Chrysler, Ford, and General Motors) and many dealers were [\*1186] "mom and pop" businesses. 49 State legislatures were convinced that the dominant manufacturers were taking advantage of their franchisees by selling cars through their company-owned stores at lower prices than the dealers could afford to charge given the wholesale prices charged by the manufacturers. 50 The direct distribution prohibitions were justified as correcting a severe imbalance in bargaining power leading to contracts of adhesion and unfair exploitation in manufacturer-dealer relations. 51

Assuming that dealer protection rationale made sense in circa 1950, its basis has almost entirely vanished today. With the advent of competition from Europe and Asia, the Big Three are no longer dominant. 52 Dealers have many choices of automobile franchisors and hence considerably more power in negotiations over franchise terms. Further, the dealers are no longer mostly mom and pops. 53 Rather, most dealers are organized into multi-dealer groups, many with hundreds of millions or billions of dollars in annual revenue. 54 Indeed, some of the largest dealer groups have more annual revenue than Tesla. 55 Most significantly, the dealer protection rationale has nothing to do with a company such as Tesla that does not seek to distribute through dealers at all. 56 No dealers, no dealer exploitation.

Recognizing that the dealer protection rationale that justified the original statutes no longer works, the dealers have attempted to recast the direct distribution prohibitions as consumer protection decisions. 57 They have argued that forcing consumers to buy automobiles from dealers rather than from manufacturers will lead to more price competition, and hence lower prices, and prevent [\*1187] consumers from manufacturer exploitation. 58 These consumer protection arguments have been roundly rejected by economists, 59 the Federal Trade Commission (FTC), 60 and major proconsumer groups such as the Consumer Federation of America, Consumer Action, Consumers for Automobile Reliability and Safety, and the American Antitrust Institute. 61 Nonetheless, the dealers have succeeded in using the existing structure of dealer protection laws to block or slow Tesla's direct distribution program in a number of states. 62

The Tesla story evidences most of the factors that contribute to the persistence of anticompetitive regulations. The dealers have a concentrated interest in preserving their protected position, while the costs of that protectionism are spread out over millions of consumers. In the state with arguably the most pernicious record with respect to direct distribution reform--Michigan--there is a record of antireform advocacy by a leading incumbent--General Motors--and acquiescence by the political class to protect an in-state champion against an out-of-state challenger. 63 Even though consumers complain more about car dealers than about any other business, indicating the baseline system is not particularly attractive to them, 64 the dealers have invoked fears about the risks of direct distribution in opposition to legislative reforms. And legislative [\*1188] inertia has slowed the consideration of reform bills in some states, extending the incumbent regulatory scheme long past its reasonable expiration date. 65

The structural factors weighing against proconsumer and pro-innovation reforms will not block Tesla forever. The company has already seen significant successes in some state legislatures and courts and is progressively penetrating the market. 66 Yet it would be misguided to consider the company's eventual success a reason not to worry about the structural factors entrenching anticompetitive regulations, especially those foreclosing innovation. No monopoly is permanent--even the most persistent are eventually eroded. 67 Innovative technologies will almost always find a way out eventually, despite incumbent machinations. 68 What incumbents can buy is not monopoly in perpetuity but in extension. 69 Those years or decades of extension are costly to society. They represent significant overcharges to consumers, misallocations of social resources and, in the extreme, impairment to health and safety-- even lives lost. 70

Not every instance of anticompetitive state or local regulation exhibits the full set of explanatory factors discussed in this Article as cleanly as the ongoing Tesla saga does. Yet the Tesla story is more paradigmatic than idiosyncratic. Across the economy, incumbent technologies are structurally advantaged to deploy regulatory forces to stifle or slow innovation.

[\*1189] II. CONSTITUTIONAL AND ANTITRUST PRINCIPLES AS A CHECK ON ANTICOMPETITIVE REGULATION

If democratic processes fail to check anticompetitive state and local regulations on a systematic basis, then what can be done about it? Among the potential tools are institutional efforts to address the quality of legislation and regulation through democratic processes, such as creating governmental competition advocacy bodies within state and local governments or using federal purse strings to incentivize state and local governments to reevaluate their regulations. These democratic options are important, but they often fall prey to the pathologies of democratic decision making identified earlier. 71 Competition advocates--whether in government or in the private sector--often face formidable structural barriers to advancing the procompetition interest: entrenched incumbent monopolies, difficulties in mobilizing consumer support given the often diffuse nature of consumer harm, and institutional biases against change. 72

In addition to the democratic options, there are what could be styled counterdemocratic possibilities, insofar as they involve the use of courts or agencies to strike down anticompetitive statutes and regulations as inconsistent with some overarching norm of federal law, whether statutory or constitutional. 73 These counterdemocratic possibilities often do not run into the same structural status quo biases as the democratic possibilities do. For example, advocates of a legal theory for overruling an anticompetitive state or local regulation do not have to mobilize broad political support for their position or surmount the "veto gates" 74 built into ordinary political processes. Rather, they typically only have to persuade a small set of elite decision makers that their position is legally correct. It is with these counter-democratic possibilities that this Article is primarily interested.

[\*1190] The counterdemocratic or countermajoritarian quality of these deployments of judicial review is what places their use in some doubt, 75 even granting the assumption that they are targeting objectively undesirable regulations. 76 In the arc of American history, the courts have vacillated in their willingness to engage in such judicial review since the mid-twentieth century. Late nineteenth and early twentieth century courts were willing to engage in broad judicial review of economic regulation, 77 but the tide turned strongly against such review in the mid-twentieth century. 78 Only in recent years have glimmers of a return to some form of strong judicial review of anticompetitive regulations made a reappearance. 79

A. Lochner, anti-Lochner, and Parker

The stage for the current constellation of judicial doctrines and attitudes towards federal judicial review of anticompetitive state and local regulations was set through the progression of Lochner-era substantive due process, the anti-Lochner constitutional revolution of 1937, and the extension of anti-Lochner sentiment to federal antitrust law in the creation of Parker's state action immunity doctrine in 1943. 80 In 1905, the Supreme Court in Lochner struck down a New York law regulating bakeshop working hours on substantive due process grounds, 81 over Justice Oliver Wendell Holmes's famous objection that "[t]he Fourteenth Amendment does not enact Mr. Herbert Spencer's Social Statics." 82 During the Progressive and New Deal eras, Lochner and Lochnerism were broadly vilified for interfering with progressive reforms and substituting judges' economic views for those of legislatures. 83 In the New Deal constitutional revolution associated with the year 1937 (although spanning a few years in either direction), the Supreme [\*1191] Court announced it was getting out of the Lochner business--that it would not strike down economic legislation simply on the grounds that it was, in the judgment of the court, ill-considered. 84 Over time, it became clear that the anti-Lochner jurisprudence extended to nakedly anticompetitive regulations adopted to favor economic special interests to the detriment of the consuming public. In cases such as Williamson v. Lee Optical 85 and Ferguson v. Skrupa, 86 there was a fairly apparent record that the regulations in question had been adopted to stifle competition and benefit economic special interests, but the courts refused to create an exception to the anti-Lochner doctrine on those grounds. 87 In Williamson, the Court acknowledged that the "Oklahoma law may exact a needless, wasteful requirement in many cases," but insisted that the "day is gone when this Court uses the Due Process Clause of the Fourteenth Amendment to strike down state laws, regulatory of business and industrial conditions, because they may be unwise, improvident, or out of harmony with a particular school of thought." 88 Rather, the Court held that "[f]or protection against abuses by legislatures the people must resort to the polls, not to the courts." 89 In 1943, the Supreme Court in Parker v. Brown also made clear that it would not permit the federal Sherman Act to be used as an end-run around the anti-Lochner cases. 90 Parker involved both dormant commerce clause and Sherman Act challenges to California's Agricultural Prorate Act, which forced farmers into a marketing plan that effectively operated as an output reduction cartel run by farmers. 91 The Supreme Court rejected both challenges. 92 Finding "nothing in the language of the Sherman Act or in its history which suggests that its purpose was to restrain a state or its officers or agents from activities directed by its legislature," 93 the Court created a doctrine of state action immunity for anticompetitive state [\*1192] and local laws. 94 The effect of this ruling was to restrict the Sherman Act's coverage solely to purely private conduct. 95 Anticompetitive schemes orchestrated by the state would be excluded from judicial review. 96 As Judge Merrick Garland has observed, Parker is best understood as a continuation of the post-1937 jurisprudence rejecting Lochner: Parker v. Brown was much less a case about judicial faith in economic regulation than it was a case about judicial respect for the political process. Parker was indeed a child of its times, but the most salient element of that historical context was the Court's recent rejection of the Lochner-era doctrine of substantive due process, under which federal courts struck down economic regulations they viewed as unreasonably interfering with the liberty of contract. Having only just determined not to use the Constitution in that manner, the Court was not about to resurrect Lochner in the garb of the Sherman Act. 97

B. The Potential for an Increased Level of Judicial Scrutiny

As of 1943, one would have been justified in believing that, at least from the perspective of federal judicial review, anticompetitive state and local regulations would receive a free pass unless they [\*1193] committed certain egregious violations, such as disadvantaging "discrete and insular minorities" 98 or discriminating against out-of-state commerce. 99 But the judicial impulse to cast a stern glance at perniciously anticompetitive regulations could not be forever stifled, and before long cracks began to appear in the courts' anti-Lochnerian resolve.

Antitrust law and its state action immunity doctrine were the first to move in a significantly more interventionist direction. By the time of the Midcal decision, the state action immunity doctrine had been narrowed to permit judicial scrutiny unless the state regulation met a two-part test: (1) clear and affirmative expression of the anticompetitive policy by the sovereign state itself, and (2) active supervision of the policy's implementation by state actors. 100 Under this structure, the courts have invalidated a number of anticompetitive state regulatory schemes--most recently the practice of delegating regulatory power to occupational licensing boards staffed with potentially self-interested industry participants. 101

The Midcal test invokes a democracy-reinforcement theory of antitrust judicial review. 102 States may enact anticompetitive regulations so long as they take conspicuous responsibility for them. 103 If the state can be obviously identified with the scheme, then perhaps citizens will "vote out the bums" if the costs to consumers are too high. 104 Alas, many anticompetitive regulations escape Midcal's net because of the systemic factors identified in the previous section. 105 Even when a state conspicuously takes ownership of an anticompetitive scheme, democratic processes may fail to provide a remedy because of the asymmetry of costs and benefits [\*1194] between producers and consumers, the externalization of costs outside the voting jurisdiction, and the entrenched advantage of technological incumbency. 106

In light of the limited efficacy of Midcal's regime, one could consider additional ways to increase the level of antitrust scrutiny of anticompetitive state and local regulations. Commentators have proposed various such doctrinal approaches to invigorate antitrust preemption. For example, courts might adopt a cost-externalization test, which would invalidate regulatory schemes that externalize a disproportionate share of monopoly overcharges outside the boundaries of the political district enacting the regulation. 107 Or, as I have proposed elsewhere, they might read the Parker doctrine as entirely inapplicable to enforcement actions by the FTC--a legal question that the Supreme Court has held is still open. 108 In the event that the courts hold Parker inapplicable to the FTC, the Commission might play a significantly enhanced role in checking anticompetitive abuses by state and local governments.

Despite calls for a broader use of federal antitrust law to police anticompetitive state and local regulations, the Supreme Court continues to refine the Parker doctrine with an eye on Lochner. Then-Justice Rehnquist once worried that the Court should not "engage in the same wide-ranging, essentially standardless inquiry into the reasonableness of local regulation that th[e] Court … properly rejected" in terminating Lochnerism. 109 In his dissenting opinion in Community Communications Co. v. City of Boulder, Justice [\*1195] Rehnquist warned about the risks of opening up antitrust review of municipal regulations in a way that would require cities to justify their regulations, and the courts, in turn, to weigh those justifications. 110 Rehnquist wrote:

If the Rule of Reason were "modified" to permit a municipality to defend its regulation on the basis that its benefits to the community outweigh its anticompetitive effects, the courts will be called upon to review social legislation in a manner reminiscent of the Lochner era. Once again, the federal courts will be called upon to engage in the same wide-ranging, essentially standardless inquiry into the reasonableness of local regulation that this Court has properly rejected. Instead of "liberty of contract" and "substantive due process," the procompetitive principles of the Sherman Act will be the governing standard by which the reasonableness of all local regulation will be determined. Neither the Due Process Clause nor the Sherman Act authorizes federal courts to invalidate local regulation of the economy simply upon opining that the municipality has acted unwisely. The Sherman Act should not be deemed to authorize federal courts to "substitute their social and economic beliefs for the judgment of legislative bodies, who are elected to pass laws." The federal courts have not been appointed by the Sherman Act to sit as a "superlegislature to weigh the wisdom of legislation." 111

Also in the shadow of Lochner, recent years have shown glimmers of a reinvigoration of constitutional doctrines checking anticompetitive abuses by state and local governments. The negative or dormant commerce clause--limited by the Parker Court on anti-Lochner grounds--has occasionally been deployed to invalidate not only anticompetitive regulatory schemes 112 that discriminated against out-of-state interests, but also, on occasion, those that impose significant burdens on interstate commerce without a sufficient justification. 113 As of this writing, Tesla is testing the limits of these [\*1196] doctrines in its challenge to Michigan's direct distribution law. 114 Its complaint for injunctive relief asserts:

[Michigan's] [p]articularly egregious protectionist legislation … blocks Tesla from pursuing legitimate business activities and subjects it to arbitrary and unreasonable regulation in violation of the Due Process Clause of the Fourteenth Amendment; subjects Tesla to arbitrary and unreasonable classifications in violation of the Equal Protection Clause of the Fourteenth Amendment; and discriminates against interstate commerce and restricts the free flow of goods between states in violation of the dormant Commerce Clause. 115

Thus far, Tesla has survived a motion to dismiss in federal court and won a key discovery motion seeking automobile dealers' communications concerning the Michigan ban on direct distribution. 116

Perhaps even more significant have been a handful of court of appeals decisions applying equal protection principles to invalidate anticompetitive regulations designed solely to protect a discrete group of economic actors from competition--although there remains a circuit split over this practice. Morbidly, the most significant cases have all been related to funeral parlors and casket sales.

In 2004, the Tenth Circuit in Powers v. Harris rejected a constitutional challenge to an Oklahoma statute that limited casket sales to licensed funeral parlors. 117 The court accepted the premise that the statute had no genuine health and safety rationale and was "a classic piece of special interest legislation designed to extract monopoly rents from consumers' pockets and funnel them into the coffers of a small but politically influential group of business people--namely, Oklahoma funeral directors." 118 Nonetheless, the court held its hands were tied by the anti-Lochner cases--particularly [\*1197] Williamson and Ferguson, which also involved (arguably) nakedly parochial anticompetitive regulations. 119

On the other hand, in their own casket cases, the Fifth and Sixth Circuits invalidated the anticompetitive schemes on equal protection grounds, holding that "protecting a discrete interest group from economic competition is not a legitimate governmental purpose" and therefore fails even rational basis review. 120 This exercise of what Judge Ginsburg calls "rational basis with economic bite" could grow into a significant check on anticompetitive state and local regulation if utilized more expansively. 121 If this Article's premise is valid--that regulations designed solely to protect "discrete interest group[s] from economic competition" 122 are pervasive--then the federal courts have their work cut out for them if they take up the casket maxim with seriousness.

However, it is far from certain that they will or should. Despite the movement towards enhanced scrutiny of anticompetitive economic cronyism just described, the ghosts of Lochner continue to loom large. Even judges unsympathetic to the casket regulations may be concerned about the prospect of unelected judges substituting their own economic preferences for those of democratically elected representatives. In Powers, the Tenth Circuit listed a series of classically anti-Lochner rationales (including a rejection of the role of the Platonic guardian hypothesized in this Article) for refusing to embrace the Sixth Circuit's antiparochialism principle:

First, in practical terms, we would ~~paralyze~~ state governments if we undertook a probing review of each of their actions, constantly asking them to "try again." Second, even if we assumed such an exalted role, it would be nothing more than substituting our view of the public good or the general welfare for that chosen by the states. As a creature of politics, the definition of the public good changes with the political winds. There simply is no constitutional or Platonic form against which [\*1198] we can (or could) judge the wisdom of economic regulation. Third, these admonitions ring especially true when we are reviewing the regulatory actions of states, who, in our federal system, merit great respect as separate sovereigns. 123

So here is the question for those who accept this Article's central premise regarding the prevalence of anticompetitive state and local regulation and yet worry, like the Powers court, about a return to Lochner: If one is interested in pulling additional judicial levers to scrutinize anticompetitive state and local regulations, but worried about returning to Lochnernism, how do the constitutional and antitrust levers compare? Are both equally susceptible to misuse and abuse, is one less risky than the other, and are there limits that could be placed on both to cabin their potential risks? This Article's final Part compares the constitutional and antitrust tools as potential foils to anticompetitive state and local regulation to help answer these questions.

III. COMPARING THE RISKS AND LIMITS OF THE CONSTITUTIONAL AND ANTITRUST TOOLS

A. Limiting the Scope of Judicial Review to Regulations Affecting Competition

The fear of a return to Lochnerism is in large part a fear that judicial review of economic regulatory decisions is a Pandora's box that, once open, would quickly unleash a full-scale movement toward a substitution of judicial economic philosophies for those of the democratically responsive branches. 124 Hence, in the current constellation of Lochner-phobia, it is important to explain how any doctrine that invites increased judicial scrutiny of economic regulation would be cabined or restrained by a workable limitation principle. Both the antitrust and constitutional tools under consideration embody such a limitation principle insofar as they do not propose universal federal scrutiny of all undesirable state economic regulation. Instead, they limit the scrutiny to regulations that harm [\*1199] competition for the benefit of identifiable special interests. In other words, the prima facie case in either event requires demonstration of competitive harm as opposed to merely social undesirability. 125 The "competitive harm" limitation principle excludes from judicial review a wide set of regulations and hence limits the range of judicial interference with state regulatory schemes. Many cronyist regulations line the pockets of politically connected special interests without necessarily impairing competition. Consider, for example, a city ordinance that required disposal of a certain kind of medical waste at a pharmacy. Assume further that the waste in question could be safely disposed of through ordinary garbage collection, and the sole purpose of the scheme in question was to provide pharmacies with an opportunity to charge a fee for collecting the waste. Our hypothesized Platonic guardian would wish to overturn that regulation but could not do so on the constitutional or antitrust grounds under consideration because the regulation in question does not limit competition in any important sense. Rather than stifling competition in a legitimate market, it creates a new market for an undesired and unnecessary service. Lochner-phobes may wonder whether this limitation principle is limited enough. Although the limitation carves off a large swath of cronyist regulations from review, it still includes a relatively large universe of regulations, creating the possibility that judges will have a free hand to strike down many important state regulatory programs in the name of enhanced competition. Those less worried about Lochner and more willing to encourage judicial review of economic regulation may worry that the limitation principle is too limited and that it would allow a vast universe of cronyist regulation to escape judicial scrutiny on the same grounds that much cutthroat business behavior escapes antitrust scrutiny today--it may be unethical or undesirable, but does not fall within the purview of the antitrust laws because it does not impair general market competitiveness. 126 [\*1200] Limiting the scope of judicial review to economic regulations impairing competition also raises a question of legal principle. As to antitrust, it is easy to justify such a principle. Notwithstanding Oliver Wendell Holmes's protestation that the Sherman Act "says nothing about competition," 127 a century of judicial construction has oriented the antitrust laws towards a singular focus on competition. 128 On the other hand, it is not obvious that constitutional scrutiny should rise or fall on the effects a cronyist regulation has on competition. It may be true that "protecting a discrete interest group from economic competition is not a legitimate governmental purpose," 129 but it seems equally true that dispensing economic rents to favored discrete interest groups more generally is also not a legitimate government purpose. In either case, the argument for limiting judicial review is not that the set of targeted regulations is constitutionally legitimate, but that the process of separating sheep from goats is fraught with the potential for judicial usurpation.

B. Considering Governmental Justifications for Restraints on Competition

Assuming that judicial review of anticompetitive state and local regulations is to occur with some degree of bite, the fighting question may often become how to evaluate the state's proffered justifications for the restraint on competition. Both antitrust and constitutional tools would need to allow ample room for the state to demonstrate verifiable justifications for the challenged regulations. To put this point in antitrust parlance, there are no per se unlawful state restraints on competition--the state's reasons for regulating will always be up for review in judicial or administrative proceedings challenging their validity. [\*1201] The critical question is how much interrogation into the state's proffered justifications a court or reviewing agency would, could, or should undertake. In conventional post-Lochner terms, economic regulations were subjected to no more than rational basis review--an exceedingly deferential standard of review. 130 The state did not have to advance any empirical support for its proffered justifications and, indeed, did not have to advance any justifications at all. 131 Judges were supposed to uphold the regulation if they could conceive of any justification that might plausibly support it: A State, moreover, has no obligation to produce evidence to sustain the rationality of a statutory classification. "[A] legislative choice is not subject to courtroom factfinding and may be based on rational speculation unsupported by evidence or empirical data." A statute is presumed constitutional, and "[t]he burden is on the one attacking the legislative arrangement to negative every conceivable basis which might support it," whether or not the basis has a foundation in the record. Finally, courts are compelled under rational-basis review to accept a legislature's generalizations even when there is an imperfect fit between means and ends. A classification does not fail rational-basis review because it "is not made with mathematical nicety or because in practice it results in some inequality." 132 That sort of rational basis review is far from the sort of review conducted by the Craigmiles and St. Joseph Abbey courts in striking down the Tennessee and Louisiana casket rules. 133 Those courts required evidentiary support for states' claimed justifications and subjected the states' claims to rigorous cross-examination for logical consistency. 134 In the Sixth Circuit case--Craigmiles--the court rejected the state's arguments that the casket regulation protected casket quality and public health, made it more feasible for casket sellers to advise bereaved families about which casket was most suitable for their needs, and protected against sharp business [\*1202] dealing. 135 The court found these arguments inconsistent with the state's own regulatory practices and unsupported by any record evidence. 136 Similarly, in the Fifth Circuit case--St. Joseph Abbey--the court repeated the familiar proposition that "rational basis review places no affirmative evidentiary burden on the government," but quickly added that "plaintiffs may nonetheless negate a seemingly plausible basis for the law by adducing evidence of irrationality." 137 The court then inquired into evidentiary support for the state's proferred "rational bases." 138 For example, on the ostensible consumer protection rationale for prohibiting casket sales except by licensed funeral parlors, the court observed that the FTC had largely rejected this argument as an empirical matter, noting that the FTC found "insufficient evidence that … third-party sellers of funeral goods are engaged in widespread unfair or deceptive acts or practices" and that the empirical "record [is] 'bereft of evidence indicating significant consumer injury caused by third-party sellers.'" 139 This form of review resembles antitrust litigation, where once a plaintiff raises a prima facie case of anticompetitive effect (outside of per se rules, where no justifications are allowed), the defendant typically can proffer procompetitive justifications but bears the burden of offering evidentiary support. 140 Although giving lip service to the norms of rational basis review, these courts were in fact taking a hard look at the states' proffered justifications once the regulation in question appeared prima facie to meet the description of a measure designed to protect "discrete interest group[s] from economic competition." 141 Inquiries into offsetting justifications for prima facie suspect conduct raise two doctrinal-analytical questions: (1) how tight must the fit between means and ends be in order for the conduct in question to survive scrutiny, and (2) once the conduct has been shown to advance legitimate ends, should its harms be balanced against its [\*1203] benefits, or should it simply be deemed lawful without any balancing? 142 Both constitutional and antitrust tools for addressing anticompetitive regulation would need to address these questions. As to the first question--the required tightness of means-ends fit--both constitutional and antitrust law already contain suitable doctrines. Moving up the ladder of scrutiny from rational basis review, intermediate scrutiny in constitutional law (such as that applicable to content-neutral restrictions on speech) requires that the restriction in question advance important governmental interests and not burden the protected interest (speech in the speech cases, competition in competition cases) more than necessary to further these interests. 143 The fit between means and ends need be only "reasonable," not strictly necessary or essential. 144 Unless the constitutional limitation on anticompetitive cronyism should fall into the more stringent strict scrutiny category--a very doubtful possibility--this sort of fit between regulatory means and ends would seem applicable. Antitrust law shares a similar approach to the less restrictive alternative analysis under the rule of reason, and it too would presumably apply to government restraints on competition under an expanded form of judicial review. 145 As explained in the Justice Department and FTC competitor collaboration guidelines, a reasonable, but not essential, fit between means and ends is required to credit proffered justifications for prima facie anticompetitive agreements: The Agencies consider only those efficiencies for which the relevant agreement is reasonably necessary. An agreement may be "reasonably necessary" without being essential. However, if the participants could have achieved or could achieve similar efficiencies by practical, significantly less restrictive means, then the Agencies conclude that the relevant agreement is not [\*1204] reasonably necessary to their achievement. In making this assessment, the Agencies consider only alternatives that are practical in the business situation faced by the participants; the Agencies do not search for a theoretically less restrictive alternative that is not realistic given business realities. 146 A potential difference between constitutional and antitrust analysis might arise on the second important means-ends question--whether to balance harms against benefits of the regulatory restriction. For example, suppose that a regulation limiting ride-sharing services resulted in some small safety benefit to customers but an arguably much greater harm to customers in the form of diminished choice of service options and higher prices. Should a reviewing court or agency balance the safety enhancements against the harms to competition, or should it rather conclude that, having shown a legitimate reason for its existence, the regulation should stand? Although intermediate scrutiny in constitutional law is often described as a "balancing test," courts do not generally engage in explicit balancing after passing the less restrictive alternatives inquiry. 147 Some degree of value judgment must be embedded in the inquiry into whether the state's interest is sufficiently "important," but it is rare to see a court say, in effect, that although the state's interest is concededly important and the regulation at stake is reasonably related to it, the harms caused by the regulation outweigh its benefits. 148 For purposes of the principle against protecting "discrete interest group[s] from economic competition," it seems apparent that there is no room for balancing at all, as a state [\*1205] regulation that serves some legitimate end by definition is not "simple economic protectionism." 149 By contrast, antitrust law is, in principle, supposed to require open-ended balancing at this final step: "if the monopolist's procompetitive justification stands unrebutted, then the plaintiff must demonstrate that the anticompetitive harm of the conduct outweighs the procompetitive benefit." 150 If followed in state action doctrine cases, this sort of balancing could precipitate serious accusations of Lochnerizing, as it would put judges in the position of substituting their own preferences for market outcomes over the state's legitimate regulatory objectives. Fortunately, although antitrust law nominally calls for balancing, courts typically do not engage in it. 151 Even in Microsoft--the case that most explicitly and authoritatively called for final-stage balancing--the D.C. Circuit engaged in very little, if any, true balancing. 152 Perhaps because of the incommensurability between anticompetitive or procompetitive effects or concern about chilling procompetitive conduct, courts tend to exonerate competitive behavior that is necessary to procompetitive effects without asking whether the harms outweigh the benefits. 153 In order to stave off Lochnerizing concerns, any expanded antitrust review of state and local regulations might need to formalize this practice doctrinally: Once a state demonstrates that the regulation in question is reasonably tailored to achieve some legitimate governmental objective, [\*1206] antitrust does not require balancing of the harms to competition against the legitimate governmental objectives. A final question unique to antitrust review is whether, when it comes to means-ends review, the catalogue of permissible ends is limited to those recognized by antitrust law as "procompetitive." One of the important doctrinal and policy structures of antitrust law is a division of the world into virtues that are said to be "procompetitive" and those that are not. 154 To count as a legitimate virtue in the antitrust domain, an effect must be "procompetitive," meaning that it must work to enhance or improve market competition. 155 Supposed benefits of a restraint that assume that competition is itself the problem in need of curtailment are labeled with the epithet of "ruinous competition" theories and are dismissed as inconsistent with the Sherman Act's procompetition policy. 156 While this single-minded devotion to competition may make sense as to the world of private restraints, it is less clear that it can be applied sensibly to governmental regulation. Do governments not have the right to take the view that competition of certain types causes social evils that should be curtailed? For example, many regulatory restrictions on alcohol and tobacco distribution are designed to decrease competition and hence reduce output as compared to that which would be obtained in a competitive market. 157 While it may be undesirable for private actors to limit harmful output through private means, the state's police power surely includes the right to do so, including by limiting competition. 158 This suggests that the range of regulatory interests [\*1207] states might legitimately advance in support of challenged regulations would be broader than those deemed "procompetitive" in conventional antitrust analysis. Opening the door to a wider scope of justifications in cases where the restraint on competition is imposed by governmental rather than private actors would appear on first impression to favor the government. Such a widening of the rule of reason, however, raises precisely the Lochnerizing concern raised by Justice Rehnquist in his previously quoted City of Boulder dissent. 159 If courts were called upon to balance health and safety benefits against traditional competition concerns around prices and innovation, then they might well slip into a Lochnerizing mold. But perhaps such concerns could be abated by limiting the reviewing court or agency's role to determining whether the regulation in question actually supported the state's proffered goals. As long as the goals were permissible (that is, not simply protecting discrete interest groups from competition as a form of political patronage) and the regulations were reasonably related to the goals, the reviewing court or agency would not inquire more broadly into the regulation's overall desirability.

C. Institutional and Procedural Distinctions

Antitrust preemption and constitutional review are differently situated in one significant way: Constitutional equal protection, substantive due process, and dormant commerce clause principles are privately enforceable by any party that meets the Article III standing requirements--which, in this context, means at least anyone directly affected by a regulation impairing competition. 160 Antitrust has its own private right of action standing rules, 161 as well as an additional institutional feature that might significantly limit some of the abuses associated with Lochnerizing. One proposed route for increasing the preemptive scope of federal antitrust law over anticompetitive state and local regulation is to hold the [\*1208] Parker doctrine inapplicable to the FTC. 162 This would give the FTC enhanced power to challenge anticompetitive state and local regulations. Not only would this limit the incidence of challenges to state regulation (the FTC Act is not privately enforceable and only the Commission can initiate an action under the Act), 163 but it would also put the Commission itself, rather than an Article III court, in the position of making an initial decision on the case. An Article III court could ultimately become involved, as adverse Commission decisions are appealable to any federal court of appeal in which the case could have been initially brought. 164 However, lodging the antitrust review function in the FTC would grant the Commission an initial regulatory review function and the power to make factual findings subject to "substantial evidence" review. 165

### Plan

The United States Federal Government should significantly increase prohibitions on anticompetitive business practices by the private sector shielded by the state action immunity doctrine

### Federalism Adv

#### Advantage Two: Federalism

#### Scenario 1 is Tech:

#### Nextgen tech is emerging at an exponential rate – effective state regulatory experimentation avoids downsides and maximize the benefits of AI and nano

McGinnis 11(John, George C. Dix Professor of Law, Northwestern Law School, “LAWS FOR LEARNING IN AN AGE OF ACCELERATION,” <http://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=3404&context=wmlr>)

The twenty-first century’s information age has the potential to usher in a more harmonious and productive politics. People often disagree about what policies to adopt, but the cornucopia of data that modern technology generates can allow them to better update their beliefs about policy outcomes on the basis of shared facts. In the long run, convergence on the facts can lead incrementally to more consensus on better policies. More credible factual information should over time also help make for a less divisive society, because partisans cannot as easily stoke social tensions by relying on false facts or exaggerated claims to support conflicting positions. Thus, a central task of contemporary public law is to accelerate a politics of learning whereby democracy improves a public reason focused on evaluating policy consequences. Government should be shaped into an instrument that learns from the analysis of policy consequences made available from newly available technologies of information.1 Greater computer capacity is generating more empirical analysis.2 The Internet permits the rise of prediction markets that forecast policy results even before the policies are implemented.3 The Internet also creates a dispersed media that specializes in particular topics and methodologies, gathers diverse information, and funnels salient facts about policy to legislators and citizens.4 But a public reason focused on policy consequences will improve only if our laws facilitate it. For instance, constitutional federalism must be reinvigorated to permit greater experimentation across jurisdictions, because with the rise of empiricism, decentralization has more value for social learning today than ever before.5 Congress should include mandates for experiments within its own legislation making policy initiatives contain the platforms for their own selfimprovement.6 Creating a contemporary politics of democratic updating on the basis of facts is a matter both of great historical interest and of enormous importance to our future. In the historical sweep of ideas, a government more focused on learning from new information moves toward fulfilling the Enlightenment dream of a politics of reason—but a reason based not on the abstractions of the French Revolution, but instead on the hard facts of the more empirical tradition predominating in Britain. By displacing religion from the center of politics, the Enlightenment removed issues by their nature not susceptible to factual resolution, permitting a focus on policies that could be improved by information.7 The better democratic updating afforded by modern technology can similarly increase social harmony and prosperity by facilitating policies that actually deliver the goods. For the future, a more consequentially informed politics is an urgent necessity. The same technological acceleration that potentially creates a more information-rich politics also generates a wide range of technological innovation—from nanotechnology to biotechnology to [AI] artificial intelligence. Although these technologies offer unparalleled benefits to mankind, they may also create catastrophic risks, such as rapid environmental degradation and new weapons of mass destruction.8 Only a democracy able to rapidly assimilate the facts is likely to be able to avoid disaster and reap the benefits inherent in the technology that is transforming our world at a faster pace than ever before. Every industry that touches on information—book publishing, newspapers, and college education to name just a few—is undergoing a continuous series of revolutionary changes as new technology permits delivery of more information more quickly at lower cost. The same changes that are creating innovation in such private industries can also quickly create innovation in social governance. But the difference between information-intensive private industries and political institutions is that the latter lack the strong competitive framework for these revolutions to occur spontaneously. This Essay thus attempts to set out a blueprint for reform to make better use of some available information technologies. Part I describes the reality of technology acceleration as the acceleration both creates the tools for democratic updating and prompts its necessity. Technological acceleration is the most important development of our time—more important even than globalization. Although technologists have described and discussed its significance, its implications for law and political structure have been barely noticed. Part II briefly discusses how better social knowledge can change political results. A premise of the claim is that some political disagreements revolve about facts, not simply values. As a result, better social knowledge can help democracies design policies to achieve widely shared goals. Social knowledge energizes citizens to act on those encompassing interests, like improved public education, because they come to better recognize the policy instruments to advance those interests. Better social knowledge provides better incentives for citizens to vote on these interests. Part III considers the mechanisms for creating a contemporary politics of democratic updating that begins to meet the needs of the age of accelerating technology. It focuses on two of the new resources that can have substantial synergies in improving social common knowledge and shows how an increase in common knowledge can systematically improve political results by providing better incentives for citizens to work for encompassing social goods. First, Part III considers the improvement in empirical analysis of social policy that flows from increasing computational capacity. It then discusses how specialized and innovative media does much more than disseminate opinions: it widely distributes facts and factual analysis. The combination of these technologies can better discipline experts and representatives, providing stronger incentives for them to update on the basis of new facts. Part IV discusses the information-eliciting rules that will maximize the impact of new technologies of information. These steps include a program of restoring, where possible, governmental structures that permit appropriate decentralization for experimentation, empirical testing, and learning. Congress and regulatory agencies should structure legislation and regulations to include social experiments when such experiments would help resolve disputed matters of policy. The Supreme Court should generally refrain from imposing new substantive rights for the nation so that it is easier to evaluate the consequences of different bundles of rights chosen by the states. But it should also protect the dispersed media, like blogs, from discriminatory laws, because this dispersed media plays a crucial role in modern policy evaluation. In short, the Supreme Court needs to emphasize a jurisprudence fostering social discovery and the political branches need to create frameworks for better social learning. Constitutive structures encouraging and evaluating experimentation become more valuable in an age where better evaluation of social experiments is possible. I. TECHNOLOGICAL ACCELERATION It is the premise of this Essay that technological acceleration is occurring and that our political system must adapt to the world it is creating. The case for technological acceleration rests on three mutually supporting kinds of evidence. First, from the longest-term perspective, epochal change has sped up: the transitions from hunter-gatherer society to agricultural society to the industrial age each took progressively less time to occur, and our transition to an information society is taking less time still. Second, from a technological perspective, computational power is increasing exponentially, and increasing computational power facilitates the growth of other society-changing technologies like biotechnology and nanotechnology. Third, even from our contemporary perspective, technology now changes the world on a yearly basis both in terms of hard data, like the amount of information created, and in terms of more subjective measures, like the social changes wrought by social media. From the longest-term perspective, it seems clear that technological change is accelerating and, with it, the basic shape of human society and culture is changing.9 Anthropologists suggest that for 100,000 years, members of the human species were hunter-gather- ers.10 About 10,000 years ago humans made a transition to agricultural society.11 With the advent of the Industrial Revolution, the West transformed itself into a society that thrived on manufacturing.12 Since 1950, the world has been rapidly entering the information age.13 Each of the completed epochs has been marked by a transition to substantially higher growth rates.14 The period between each epoch has become very substantially shorter.15 Thus, there is reason to extrapolate to even more and faster transitions in the future. This evolution is consistent with a more fine-grained evaluation of human development. Recently, the historian Ian Morris has rated societies in the last 15,000 years on their level of development through objective benchmarks, such as energy capture.16 The graph shows relatively steady, if modest, growth when plotted on a log linear scale, but in the last 100 years development has jumped to become sharply exponential.17 Morris concludes that these patterns suggest that there may be four times as much social development in the world in the next 100 years than there has been in the last 14,000.18 The inventor and engineer Ray Kurzweil has dubbed this phenomenon of faster transitions “the law of accelerating returns.”19 Seeking to strengthen the case for exponential change, he has looked back to the dawn of life to show that even evolution seems to make transitions to higher organisms ever faster.20 In a more granulated way, he has considered important events of the last 1000 years to show that the periods between extraordinary advances, such as great scientific discoveries and technological inventions, have decreased.21 Thus, both outside and within the great epochs of recorded human history, the story of acceleration is similar. The technology of computation provides the second perspective on accelerating change. The easiest way to grasp this perspective is to consider Moore’s Law. Moore’s Law—named after Gordon Moore, one of the founders of Intel—is the observation that the number of transistors that can be fitted onto a computer chip doubles every eighteen months to two years.22 This prediction, which has been approximately accurate for the last forty years,23 means that almost every aspect of the digital world—from computational calculation power to computer memory—is growing in density at a similarly exponential rate.24 Moore’s Law reflects the rapid rise of computers to become the fundamental engine of mankind in the late twentieth and early twenty-first centuries.25 The power of exponential growth is hard to overstate. As the economist Robert Lucas has said, once you start thinking about exponential growth, it is hard to think about anything else.26 The computational power in a cell phone today is a thousand times greater and a million times less expensive than all the computing power housed at MIT in 1965.27 Projecting forward, the computing power of computers twenty-five years from now is likely to prove a million times more powerful than computing power today. To be sure, many people have been predicting the imminent death of Moore’s Law for a substantial period now,29 but it has nevertheless continued. Intel—a company that has a substantial interest in accurately telling software makers what to expect—projects that Moore’s Law will continue at least until 2029.30 Ray Kurzweil shows that Moore’s Law is actually part of a more general exponential computation growth that has been gaining force for over a 100 years.31 Integrated circuits replaced transistors that previously replaced vacuum tubes that in their time had replaced electromechanical methods of computation.32 Through all of these changes in the mechanisms of computation, its power increased at an exponential rate.33 This perspective suggests that other methods under research—from carbon nanotechnology to optical computing to quantum computing—are likely to continue growing exponentially even when silicon-based computing reaches its physical limits.34 Focusing on the exponential increase in hardware capability may actually understate the acceleration in computational capacity in two ways. First, a study considering developments in a computer task using a benchmark for measuring computer speed over a fifteen-year period suggests that the improvements in software algorithms improved performance even more than the increase in hardware capability.35 Second, computers are interconnected more than ever before through the Internet, and these connections increase collective capacity, not only because of the increasing density among computer connections, but because of the increasing density of connections among humans made possible by computers. The salient feature of computers’ exponential growth is their tremendous range of application compared to previous improvements. Almost everything in the modern world can be improved by adding an independent source of computational power. That is why computational improvement has a far greater social effect than improvements in technologies of old. Energy, medicine, and communication are now being continually transformed by the increase in computational power.36 As I will discuss in Part II, even the formulation of new hypotheses in natural and social science will likely be aided by computers in the near future. The final perspective on accelerating technology is the experience that the contemporary world provides. Technology changes the whole tenor of life more rapidly than ever before. At the most basic level, technological products change faster.37 Repeated visits to a modern electronics store—or even a grocery store—reveal a whole new line of products within very few years. In contrast, someone visiting a store in 1910 and then again in 1920—let alone in 1810 and 1820—would not have noticed much difference. Even cultural generations move faster. Facebook, for instance, has changed the way college students relate in only a few years,38 whereas the tenor of college life would not have seemed very different to students in 1920 and 1960. Our current subjective sense of accelerating technology is also backed by more objective evidence from the contemporary world. Accelerating amounts of information are being generated.39 Information, of course, is a proxy for knowledge. Consistent with this general observation, we experience exponential growth in practical technical knowledge, as evidenced by the rise in patent applications.40 Thus, the combination of data from our present life, together with the more sweeping historical and technological perspectives, makes a compelling case that technological acceleration is occurring. It is this technological acceleration that creates both the capacity and the need for improving collective decision making. As technology accelerates, it creates new phenomena, from climate change to biotechnology to artificial intelligence of a human-like capacity. These technologies may themselves have very large positive or negative externalities and may require government decisions about their prohibition, regulation, or subsidization to forestall harms and capture their full benefits. They may also cause social dislocations, from unemployment to terrorism, that also require certain collective decisions. Society can best handle these crises not only by making better social policy to address them directly but by improving social policy more generally to create both more resources and more social harmony to endure them. Thus, society must deploy information technology in the service of democratic updating if it is to manage technological acceleration

#### Unregulated tech diffuses globally---acquisition by omnicidal non-state actors risks extinction via super-pathogens, eco-terrorism, and planetoid bombs.

Torres 21 (Phil Torres, Former writer for Future of Life Institute, Former Affiliate Scholar at the Institute for Ethics and Emerging Technologies, M.A. in Neuroscience from Brandeis University, Ph.D. candidate at Leibniz Universität Hannover; “International Criminal Law and the Future of Humanity: A Theory of the Crime of Omnicide;” 03-08-21, <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3777140>, TM)

3.2 The Greatest Threats Arise from Nonstate Actors. Since the Neolithic Revolution some 12,000 years ago, groups of people—tribes, city-states, kingdoms, countries, and empires—have invariably possessed a greater potential to cause harm than individuals or small collections of individuals within those groups. For example, the Roman Empire considered as a cohesive entity was more powerful than any Roman citizen, just as Nazi Germany had more resources to leverage against the Jewish people than any single antisemite. (This idea finds expression in Max Weber’s famous characterization of the state as possessing a “monopoly of the legitimate use of violence within a given territory.”70) But this dynamic is quickly changing: the difference in “violence capacity” between state and nonstate actors is narrowing as a result of the growing power and accessibility of dual-use emerging technologies, which are almost universally being developed at an exponential or superexponential pace, in accordance with the so-called Law of Accelerating Returns, which subsumes more specific tends like Moore’s Law, Huang’s law, the Carlson curve, Dennard scaling, Keck’s law, Kryder’s law, and so on. As the “power and accessibility” locution 71 implies, there are two crucial features of such technologies, namely:

(i) Omniviolence thesis. The growing power of emerging technologies means a lower ratio of “killers to killed,” or “K/K ratio,” per incident, a phenomenon that Daniel Deudney neologizes as “omniviolence.” Consider a non-lethal recent case that exemplifies this trend: the 2016 Dyn 72 cyberattack. This distributed denial-of-service (DDoS) attack may have been perpetrated by a single “angry gamer.”73 Yet an extraordinary number of major websites were disrupted: Airbnb, Amazon, BBC, The Boston Globe, CNN, Comcast, FiveThirtyEight, Fox News, The Guardian, iHeartRadio, Imgur, National Hockey League, Netflix, The New York Times, PayPal, Pinterest, Pixlr, Reddit, SoundCloud, Squarespace, Spotify, Starbucks, Storify, the Swedish Government, Tumblr, Twitter, Verizon Communications, Visa, Vox Media, Walgreens, The Wall Street Journal, Wired, Yelp, and Zillow. This is a non-exhaustive list of the websites affected, which numbered more 74 than 60 in total. Thus, the “affecter-to-affected ratio,” so to speak, of this attack was extremely low: one person managed to take down a vast constellation of websites that hundreds of millions of people visit and depend upon every day. The point is that this trend of mass empowerment can be found within virtually every domain of emerging technology, including biotechnology, synthetic biology, nanotechnology, drone technology, and artificial intelligence. Whereas in the past, bioterrorism took the form of poisoning wells with carcasses contaminated with the plague, soon it could take the form of synthesizing a super-pathogen that combines the lethality of rabies, the incurability of Ebola, the contagiousness of the common cold, and the long incubation period of HIV. Whereas in the 75 past, destroying an enemy civilization required a physical attack involving tens or hundreds of thousands of soldiers, today a nuclear electromagnetic pulse (NEMP) could fry the electrical infrastructure of an entire country. Whereas in the past, annihilating Earth’s biosphere was technically impossible, future self-replicating nanobots could potentially disassemble all organic matter around the world, thus resulting in a lifeless, barren planet. And so on.

(ii) Democratization thesis. This refers to the phenomenon of dual-use emerging technologies becoming increasingly accessible to the demos. When combined with (i), it implies that omniviolence is being distributed among state and nonstate actors—i.e., the K/K ratio is falling while the number of potential “killers” that instantiate the first “K” is growing.

Historically speaking, the first actor—a state—to acquire the technological ability to unilaterally destroy the world was the United States, sometime around 1948 or 1949, when the United States stockpiled enough nuclear weapons, about 100 in total, to have single-handedly initiated a worldwide nuclear winter. I choose the number “100” here because a 2008 study found that a regional “nuclear exchange involving 100 Hiroshima-size bombs (15 kilotons) on cities in the subtropics” could effectively “lower temperatures regionally and globally for several years, open up new holes in the ozone layer protecting the Earth from harmful radiation, reduce global precipitation by about 10 percent, and trigger massive crop failures.” Thus, bracketing the nontrivial 76 fact that many weapons built since World War II have a far greater explosive yield than 15 kilotons of TNT, we can crudely estimate when countries acquired the capacity to unilaterally cause a global nuclear winter by identifying the years during which their arsenals exceeded 100 nuclear weapons. On this criterion—for perspective, consider that the United State’s “Castle Bravo” weapon was equivalent to 15 megatons of TNT, while the Soviet Union’s “Tsar Bomba” had an extraordinary 58 megaton yield—the Soviet Union joined the club of potential world-destroyers at least by 1952, the United Kingdom at least by 1962, China at least by 1971, France at least by 1973, and other countries like Pakistan, India, and Israel perhaps by the 2010s, depending on the make-up of their arsenals.77 Thus, since World War II, the number of entities with doomsday capabilities has grown from zero to eight.

But the democratization of dual-use emerging technologies is rapidly transforming this predicament by multiplying the number of not only state but, far more importantly, nonstate actors having the capacity to unilaterally destroy the world. As I have previously discussed, there are four axes along which this trend, which I have elsewhere dubbed the “threat of universal unilateralism,” is unfolding. In brief, these are:

(i) The intelligence threshold that must be exceeded to effect large-scale destruction is lowering. This fact is humorously, but accurately, captured by Eliezer Yudkowsky’s so-called “Moore’s Law of Mad Science,” which states that “every eighteen months, the minimum IQ necessary to destroy the world drops by one point.” (ii) The information threshold that one must exceed to use 78 a wide range of emerging technologies in a competent manner is also falling. For example, the genomes of many of the most dangerous pathogens, including Ebola and smallpox, are readily accessible online, thus making such information easy to copy-paste onto one’s computer. (iii) The skill threshold that one must exceed to convert one's know-that into actionable know-how is dropping as well. Perhaps the most conspicuous example comes from synthetic biology, which is “explicitly devoted to the minimization of the importance of tacit knowledge.” The BioBricks 79 Foundation’s standardization of biological entities and devices like digital-to-biological converters are also relevant here. Yet the irrelevance of tacit knowledge may be especially salient with respect to molecular nanotechnology—e.g., nanofactories that can manufacture virtually any technical product for virtually zero cost given a digital blueprint, source of energy, and feedstock molecule like acetone or acetylene.81 And finally, (iv) the materials and equipment necessary for omniviolence are rapidly becoming more widely available and affordable. For example, the advent of nanofactories would make it possible to produce super-high-quality technical products of all sorts at almost no cost, and third-generation laser enrichment technologies such as SILEX (whereby uranium isotopes are separated by laser excitation) could enable small groups or lone individuals to produce weapons-grade uranium without the need for costly, large centrifuges.82

To couch the implications of these four trends in terms of the 2016 Dyn cyberattack, it is no longer unreasonable to ask in the wake of a major incident spanning multiple countries and affects millions of people whether the perpetrator is a state actor like Russia or North Korea, or someone in [their] ~~her or his~~ basement, with limited knowledge of computer systems or how to initiate a DDoS attack, using a $1,000 computer. To underline this point, consider the following two scenarios that could potentially cause the extinction of humanity. Both illustrate the fact that, as Benjamin Wittes and Gabriella Blum observe, greater technological capabilities entail greater susceptibility to harm; in their words, “technologies that expand the power to attack necessarily expand vulnerability to attack.”83 However, for reasons relating to “information hazards,”84 I have not chosen the most effective ways of bringing about human extinction that scholars in the nascent field of “existential risk studies” have privately devised (and kept secret within the community for information-hazard reasons), nor will I go into much detail about the logistics of actually realizing these scenarios. The simple point is merely to emphasize that we are, indeed, entering a new era of unprecedentedly distributed destructive capabilities.

Scenario 1: The CRISPR/Cas9 system consists of a segment of DNA from bacterial immune systems—CRISPR—and a protein that acts as “molecular scissors” capable of cutting DNA at target sequences—Cas9—which are specified by an RNA guide molecule. This system has enabled scientists to alter the genomes of organisms with unprecedented precision. Now consider “gene drives,” or genetic mechanisms that enable a segment of DNA to be inherited by an organism’s offspring at a probability of greater than 50 percent, even when the allele expressed by the gene is deleterious to the organism. Gene drives are found in nature, but advancements in synthetic biology are enabling scientists to create them artificially. Combining these two technologies: CRISPR/Cas9 and gene drives will enable the synthesis of genes that propagate through and decimate entire populations of organisms. At the extreme, so-called “suppression drives” that “reduce the population of the target species (for example by damaging a gene with a function essential to survival or reproduction)” could precipitate the extinction of the affected species.85

Now imagine that a terrorist sets up a “biohacker” lab with some basic synthetic biology capabilities. It will soon be feasible for a group or lone wolf to create suppression drives that target, for example, the primary pollinators: bees, wasps, moths, butterflies, and beetles. If these short-generation species were to perish, the result would be a cascade of disasters that E.O. Wilson adumbrates as follows, to quote him at length:

A majority of flowering plants, upon being deprived of their pollinators, cease to reproduce. Most herbaceous plant species among them spiral down to extinction. Insect-pollinated shrubs and trees hang on for a few more years, in rare cases of up to centuries. The great majority of birds and other land vertebrates, now denied the specialized foliage, fruits, and insect prey on which they feed, follow the plants into oblivion. The soil remains largely unturned, accelerating plant decline, because insects, not earthworms as generally supposed, are the principal turners and renewers of the soil. Populations of fungi and bacteria explode and remain at a peak over a few years while metabolizing the dead plant and animal material that piles up. Wind-pollinated grasses and a handful of fern and conifer species spread over much of the deforested terrain, then decline to some extent as the soil deteriorates. The human species survives, able to fall back on wind-pollinated grains and marine fishing. But amid widespread starvation during the first several decades, human populations plunge to a small fraction of their former level. The wars for control of the dwindling resources, the suffering, and the tumultuous decline to dark-age barbarism would be unprecedented in human history.86

In sum, CRISPR/Cas9 plus gene drives will open the door to unprecedentedly effective omnicidal attacks.

Scenario 2: The human expansion into space has historically coincided with the militarization of space. That is to say, the very first human-made artifact to reach space was the V2 ballistic missile built by Nazi Germany. The militarization of space continues today, with President Donald Trump, for example, announcing in 2018 the creation of a “United States Space Force” branch of the Armed Forces by 2020. But the situation is becoming more complicated as space simultaneously becomes increasingly privatized. Private companies are already delivering supplies to the International Space Station (ISS), and some plan to deliver satellites and offer tourists trips up to 50 miles above the ground, where the mesosphere becomes the thermosphere. Even more, molecular nanotechnology, which would enable one to manipulate matter with absolute atomic precision, could open up the space frontier to most everyone.87 In particular, nanofactories might enable groups and even individuals with no prior knowledge of rocket science and no manufacturing skills to build their own orbital spacecraft.88

The implications of this are unsettling, not just because more objects in space would increase the probability of an accidental Kessler syndrome (whereby shrapnel initiates a positivefeedback cascade that destroys all satellites in the Lower Earth Orbit), but because of the so-called “deflection dilemma.” This arises from the fact that technologies capable of redirecting larger asteroids or comets away from Earth could also be used to direct them toward Earth, a possibility taken seriously by many astronomers. The idea is simply that Earth is not safe from extraterrestrial impacts, a view that scientists almost unanimously rejected until the Alvarez hypothesis was vindicated by tests on the Chicxulub crater in 1990. In other words, there have been major impact events in the past and there will be more in the future. Hence, it is critical that humanity designs and builds spacecraft that could nudge incoming celestial bodies past Earth. But the dual usability of such technologies would also enable [malevolent actors] “~~madmen~~”—to borrow Sagan’s preferred term90—to potentially annihilate humanity by converting otherwise non-threatening asteroids or comets into “planetoid bombs” that smash into Earth and, in doing so, initiate a global impact winter of the sort that killed-off the non-avian dinosaurs 66 million years ago. Given the democratization of space technologies, this scenario could become increasingly probable in the coming decades.

These two scenarios illustrate the proposition that nonstate actors could plausibly bring about an omnicidal catastrophe with existing and emerging dual-use technologies. Indeed, state actors are far less likely to attempt to cause human extinction than nonstate actors, since states generally value their continued existence. For example, if humanity were to go extinct, then aspiring global autocrats (perhaps Vladimir Putin or Kim Jung-un) would be unable to fulfill their megalomaniacal ambitions. Similarly, if Hitler had destroyed the world in 1941, his vision of a Thousand Year Reich would not have been realizable. Yet Sagan notes that

in the winter and spring of 1945, Hitler ordered Germany to be destroyed—even “what the people need for elementary survival”—because the surviving Germans had “betrayed” him, and at any rate were “inferior” to those who had already died. If Hitler had nuclear weapons, the threat of a counterstrike by Allied nuclear weapons, had there been any, is unlikely to have dissuaded him. It might have encouraged him.91

The point is that under normal circumstances, states are pro-human-survival; they are much less likely to attempt an omnicidal attack than nonstate actors, who may be motivated by a range of “kill everyone” ideologies. In previous papers, I have outlined a six-part typology of groups/individuals that engender what I call “agential risks,” which are defined as follows:

Agential risk: the risk posed by any agent who could initiate an existential catastrophe in the presence of sufficiently powerful dual-use technologies either on purpose or by accident.92

Not all of the six agential risk types are germane to the present discussion, since this discussion is limited to the particular existential risk of human extinction (see section 4 for additional scenarios outlined by Bostrom ). These are the three agential risk types that are relevant: 93

(1) Omnicidal ecoterrorists, or individuals who believe that the biosphere, or Gaian system, would be better off if humans were to disappear entirely.

(2) Omnicidal ethicists, or individuals who believe that humanity should go extinct for moral reasons and that this should happen involuntarily (“pro-mortalism”).

(3) Omnicidal idiosyncratic actors, a catch-all category that subsumes individuals who harbor a death wish for humanity for idiosyncratic reasons, which might arise from sadistic, anti-humanist, misanthropic, etc. proclivities.

Although no scientific surveys have yet been conducted to assess the prevalence of omnicidal ideologies in society (such surveys would likely encounter the problem known as “Lizardman’s Constant” ), I have elsewhere catalogued a number of historical groups and individuals who almost 94 certainly would have brought about human extinction if only the means had been available.95 Convincing the reader of this point goes beyond the scope of this paper; I will thus refer them to previous work. For the nonce, I will proceed on the assumption that a nontrivial number of omnicidal agents exist in the world—that is to say, while the percentage of the global population with omnicidal urges is quite small, the absolute number is worrisomely large. This fact is enough to take the issue seriously, since as John Sotos calculates, the probability of any single individual successfully causing human extinction need be only minuscule for this to accumulate over space and time to more or less guarantee doom on timescales relevant to contemporary civilization. More 96 specifically, Sotos shows that a 1-in-100 chance of only a few hundred agents releasing a speciesdestroying pathogen yields virtually certain doom within just 100 years or so.97

#### U.S. model is key to stable nano---checks gray goo, super-weapons, and eco-collapse

Dennis 6 (Lindsay V., JD Candidate – Temple University School of Law, “Nanotechnology: Unique Science Requires Unique Solutions”, Temple Journal of Science, Technology & Environmental Law, Spring, 25 Temp. J. Sci. Tech. & Envtl. L. 87, Lexis)

Nanotechnology, a newly developing field merging science and technology, promises a future of open-ended potential. [6](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n6) Its scientific limits are unknown, and its myriad uses cross the boundaries of the technical, mechanical and medical fields. [7](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n7) Substantial research [8](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n8) has led scientists, [9](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n9) politicians [10](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n10) and academicians [11](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n11) to believe that nanotechnology has the potential to profoundly change the economy and to improve the national standard of living. [12](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n12) In addition, nanotechnology may touch every facet of human life because its products cross the boundaries of the most important industries, including electronics, biomedical and pharmaceutical  [\*89]  industries, and energy production. [13](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n13) In the future, nanotechnology could ensure longer, healthier lives with the reduction or elimination of life-threatening diseases, [14](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n14) a cleaner planet with pollution remediation and emission-free energy, [15](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n15) and the innumerable benefits of increased information technology. [16](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n16) However, certain uses, such as advanced drug delivery systems, [17](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n17) have given rise to an ethical debate similar to that surrounding cloning and stem cell research. [18](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n18) Moreover, some analysts have theorized that nanotechnology may endanger humankind with more dangerous warfare and weapons of terrorism, [19](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n19) and that nanotechnology may lead to artificial intelligence beyond human control. [20](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n20) The widespread use of nanotechnology far in the future threatens to alter the societal framework and create what has been called "gray goo." [21](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n21) Because nanotechnology has the potential to improve the products that most of us rely on in our daily lives, but also imperil society as we know it, we should research, monitor and regulate nanotechnology for the public good with trustworthy systems, and set up pervasive controls over its research, development, and deployment. In addition, its substantial impacts on existing regulations should be ascertained, and solutions incorporated into the regulatory framework. This paper addresses these concerns and provides potential solutions. Part I outlines the development of nanotechnology. Parts II and III explore the current and theoretical future applications of nanotechnology, and its potential side-effects. Then, Part IV analyzes the government's current role in monitoring nanotechnology, and the regulatory mechanisms available to manage or eliminate the negative implications of nanotechnology. Part V considers the creation of an Emerging Technologies Department as a possible solution to maximize the benefits and minimize the detrimental effects of nanotechnology. Lastly, Part VI examines certain environmental regulations to provide an example of nanotechnology's impact on existing regulatory schema.  [\*90]  Part I: Nanotechnology Defined   Nanoscience is the study of the fundamental principles of molecules and structures with at least one dimension roughly between 1 and 100 nanometers (one-billionth of a meter, or 10[su'-9']), otherwise known as the "nanoscale." [22](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n22) Called nanostructures, these are the smallest solid things possible to make. [23](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n23) Nanofabrication, or nanoscale manufacturing, is the process by which nanostructures are built. [24](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n24) Top-down nanofabrication creates nanostructures by taking a large structure and making it smaller, whereas bottom-up nanofabrication starts with individual atoms to build nanostructures. [25](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n25) Nanotechnology applies nanostructures into useful nanoscale devices. [26](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n26) The nanoscale is distinctive because it is the size scale where the properties of materials like conductivity, [27](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n27) hardness, [28](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n28) or melting point [29](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n29) are no longer similar to the properties of these same materials at the macro level. [30](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n30) Atom interactions, averaged out of existence in bulk material, give rise to unique properties. [31](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n31) In  [\*91]  nanotech research, scientists take advantage of these unique properties to develop products with applications that would not otherwise be available. [32](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n32) Although some products using nanotechnology are currently on the market, [33](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n33) nanotechnology is primarily in the research and development stage. [34](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n34) Because nanoparticles are remarkably small, tools specific to nanotechnology have been created to develop useful nanostructures and devices. [35](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n35) Two techniques exclusive to nanotechnology are self-assembly, and nanofabrication using nanotubes and nanorods. [36](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n36)  [\*92]  In self-assembly, particular atoms or molecules are put on a surface or preconstructed nanostructure, causing the molecules to align themselves into particular positions. [37](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n37) Although self-assembly is "probably the most important of the nanoscale fabrication techniques because of its generality, its ability to produce structures at different length-scales, and its low cost," [38](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n38) most nanostructures are built starting with larger molecules as components. [39](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n39) Nanotubes [40](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n40) and nanorods, [41](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n41) the first true nanomaterials engineered at the molecular level, are two examples of these building blocks. [42](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n42) They exhibit astounding physical and electrical properties. [43](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n43) Certain nanotubes have tensile strength in excess of 60 times high-grade steel while remaining light and flexible. [44](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n44) Currently, nanotubes are used in tennis rackets and golf clubs to make them lighter and stronger. [45](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n45) Part II: Nanotechnology's Uses   Researching and manipulating the properties of nanostructures are important for a number of reasons, including, most basically, to gain an understanding of how matter is constructed, and more practically, to use these unique properties to develop unique products. [46](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n46) Nanoproducts can be divided into four general categories: [47](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n47) smart materials, [48](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n48) sensors, [49](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n49) biomedical applications, [50](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n50) and optics and electronics. [51](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n51)  [\*93]  A "smart" material incorporates in its design a capability to perform several specific tasks. [52](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n52) In nanotechnology, that design is done at the molecular level. [53](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n53) Clothing, enhanced with nanotechnology, is a useful application of a smart material at the nanoscale. Certain nano-enhanced clothing contains fibers that have tiny whiskers that repel liquids, reduce static and resist stains without affecting feel. [54](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n54) Nano-enhanced rubber represents another application of a nanoscale smart material. [55](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n55) Tires using nanotech-components increase skid resistance by reducing friction, which reduces abrasion and makes the tires last longer. [56](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n56) The tires may be on the market "in the next few years" according to the National Nanotechnology Initiative (NNI). [57](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n57) Theoretically, this rubber could be used on a variety of products, ranging from tires to windshield wiper blades to athletic shoes. [58](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n58) A more complex nanotechnology smart material is a photorefractive polymer. [59](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n59) Acting as a nanoscale "barcode," these polymers could be used as information storage devices with a storage density exceeding the best available magnetic storage structures. [60](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n60) Nano-sensors may "revolutionize much of the medical care and the food packaging industries," [61](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n61) as well as the environmental field because of their ability to detect toxins and pollutants at fewer than ten molecules. [62](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n62) As the Environmental Protection Agency (EPA) recognizes: Protection of human health and ecosystems requires rapid, precise sensors capable of detecting pollutants at the molecular level. Major improvements in process control, compliance monitoring, and environmental decision-making could  [\*94]  be achieved if more accurate, less costly, more sensitive techniques were available. Nanotechnology offers the possibility of sensors enabled to be selective or specific, detect multiple analytes, and monitor their presence in real time. [63](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n63) Examples of research in sensors include the development of nano-sensors for efficient and rapid biochemical detection of pollutants; sensors capable of continuous measurement over large areas; integration of nano-enabled sensors for real-time continuous monitoring; and sensors that utilize "lab-on-a-chip" technology. [64](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n64) All fundamental life processes occur at the nanoscale, making it the ideal scale at which to fight diseases. [65](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n65) Two quintessential examples of biomedical applications of nanotechnology are advanced drug delivery systems and nano-enhanced drugs. [66](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n66) The promise of advanced drug delivery systems lies in that they direct drug molecules only to where they are needed in the body. [67](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n67) One example is focusing chemotherapy on the site of the tumor, instead of the whole body, thereby improving the drug's effectiveness while decreasing its unpleasant side-effects. [68](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n68) Other researchers are working to develop nanoparticles that target and trick cancer cells into absorbing certain nanoparticles. [69](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n69) These nanoparticles would then kill tumors from within, avoiding the destruction of healthy cells, as opposed to the indiscriminate damage caused by traditional chemotherapy. [70](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n70) Nano-enhanced suicide inhibitors [71](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n71) limit enzymatic activity by forcing naturally occurring enzymes to form bonds with the nanostructured molecule. [72](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n72) This may treat conditions such as epilepsy and depression because of the enzyme action component involved in these conditions. [73](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n73) Lastly, nanotechnology has the potential to revolutionize the electronics and optics fields. [74](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n74) For instance, nanotechnology has the potential to produce clean,  [\*95]  renewable solar power. [75](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n75) Through a process called artificial photosynthesis, solar energy is produced by using nanostructures based on molecules which capture light and separate positive and negative charges. [76](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n76) Certain Swiss watches and bathroom scales are illuminated through a nanotech procedure that transforms captured sunlight into an electrical current. [77](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n77) In the electronics field, nanostructures offer many different ways to increase memory storage by substantially reducing the size of memory bits and thereby increasing the density of magnetic memory, increasing efficiency, and decreasing cost. [78](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n78) One example is storing memory bits as magnetic nanodots, which can be reduced in size until they reach the super-paramagnetic limit, the smallest possible magnetic memory structure. [79](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n79) Advances in electronics and computing brought on by nanotechnology could allow reconfigurable, "thinking" spacecraft. [80](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n80) Some uses of nano-products already on the market include suntan lotions and skin creams, tennis balls that bounce longer, faster-burning rocket fuel additives, and new cancer treatments. [81](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n81) Solar cells in roofing tiles and siding that provide electricity for homes and facilities, and the prototypic tires, supra, may be on the market in the next few years. [82](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n82) The industry expects advanced drug delivery systems with implantable devices that automatically administer drugs and sensor drug levels, and medical diagnostic tools such as cancer-tagging mechanisms to be on the market in the next two to five years. [83](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n83) It is nearly impossible to foresee what developments to expect in nanotechnology in the decades to come. [84](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n84) Nonetheless, the book Engines of Creation presented one vision of the possibilities of advanced nanotechnology. [85](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n85) Nano-machines could be designed to construct any product, from mundane items such as a chair, to exciting items such as a rocket engine. [86](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n86) These "assemblers" could also be programmed to build copies of themselves. [87](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n87) Known as "replicators," these nano-machines could alter the world by producing an exponential quantity of themselves that are to be put to work as assemblers. [88](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n88) The development of assemblers could advance the space  [\*96]  exploration program, [89](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n89) biomedical field, [90](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n90) and even repair the damage done to the world's ecological systems. [91](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n91) Over time, production costs may sharply decrease because the assemblers will be able to construct all future products from an original blueprint at virtually no additional cost. [92](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n92) Part III: Nanotechnology's Side-Effects   With the good, however, comes the bad. The "gray goo problem," the most well-known unwanted potential consequence of the spread of nanotechnology, [93](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n93) arises when replicators and assemblers produce almost anything, and subsequently spread uncontrolled, obliterating natural organisms and replacing them with nano-enhanced organisms. [94](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n94) A more foreseeable issue is environmental contamination. [95](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n95) The EPA noted   As nanotechnology progresses from research and development to commercialization and use, it is likely that manufactured nanomaterials and nanoproducts will be released into the environment... . The unique features of manufactured nanomaterials and a lack of experience with these materials hinder the risk evaluation that is needed to inform decisions about pollution prevention, environmental clean-up and other control measures, including regulation. Beyond the usual concerns for most toxic materials ... the adequacy of current toxicity tests for chemicals needs to be assessed ... . To the extent that nanoparticles  [\*97]  ... elicit novel biological responses, these concerns need to be accounted for in toxicity testing to provide relevant information needed for risk assessment to inform decision making. [96](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n96)   In addition, nanotechnology could change the face of global warfare and terrorism. [97](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n97) Assemblers could be used to duplicate existing weapons out of superior materials, and chemical and biological weapons could be created with nano-enhanced components. [98](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n98) Modern detection systems would be inadequate to detect nano-enhanced weapons built with innocuous materials such as carbon. [99](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n99) Luckily, nanotechnology offers responses to these problems, and researchers are already tackling these issues. [100](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n100) "Labs-on-a-chip," a sensor system the size of a microchip, could be woven into soldiers' uniforms to detect toxins immediately. [101](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n101) Adding smart materials could make soldiers' uniforms resistant to certain chemical and biological agents. [102](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n102) Nanotechnology also enhances threats against citizens. Drugs and bugs (electronic surveillance devices) could be used by police states to monitor and control its citizenry. [103](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n103) Viruses could be created that target specific genetic characteristics. [104](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n104) Not only is the development of technologically advanced, devastating weaponry itself a hazardous effect of nanotechnology, but also, millions of dollars have already been spent researching potential uses of nanotechnology in the military sphere, [105](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n105) thus diverting funds from more beneficial uses such as biomedical applications and clean energy. However, these negative effects are not inevitable. By analyzing the scope of potential drawbacks accompanying these research investments, lawmakers can institute regulatory controls that could mitigate these problems.  [\*98]  Part IV: Maximizing Benefits, Minimizing Catastrophe   To minimize or eliminate the problems associated with nanotechnology, while maximizing the beneficial effects, nanotechnology research and development should be monitored and regulated by "trustworthy systems." [106](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n106) Currently, the federal government oversees a massive funding and research program with the purpose of "ensuring United States global leadership in the development and application of nanotechnology." [107](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n107) Nonetheless, as nanotechnology becomes more prevalent, more thorough regulation may be necessary. [108](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n108) Nanotechnology may greatly impact some of the largest revenue producing industries in the United States, such as the pharmaceutical and medical fields, utilities and power generation, and computer electronics. [109](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n109) Thus, it is clear that nanotechnology will likely touch every facet of human life. In addition, these powerful industries have been known to promote profits over human safety, [110](http://www.lexis.com/research/retrieve?cc=&pushme=1&tmpFBSel=all&totaldocs=&taggedDocs=&toggleValue=&numDocsChked=0&prefFBSel=0&delformat=XCITE&fpDocs=&fpNodeId=&fpCiteReq=&brand=&_m=82ab008e42cdd5d1d23cfd1d96b430bb&docnum=5&_fmtstr=FULL&_startdoc=1&wchp=dGLbVtz-zSkAb&_md5=f86737f923f2df1de12147f84a019421&focBudTerms=Nanotechnology%3A+Unique+Science+Requires+Unique+Solutions&focBudSel=all#n110) one of the reasons for their stringent regulation.  [\*99]

#### Only existential impact---that outweighs

Bostrom 2 – Nick Bostrom, Professor of Philosophy at Oxford University, “Existential Risks: Analyzing Human Extinction Scenarios and Related Hazards”, Journal of Evolution and Technology, 9(1), http://www.nickbostrom.com/existential/risks.html

1.2 Existential risks In this paper we shall discuss risks of the sixth category, the one marked with an X. This is the category of global, terminal risks. I shall call these existential risks. Existential risks are distinct from global endurable risks. Examples of the latter kind include: threats to the biodiversity of Earth’s ecosphere, moderate global warming, global economic recessions (even major ones), and possibly stifling cultural or religious eras such as the “dark ages”, even if they encompass the whole global community, provided they are transitory (though see the section on “Shrieks” below). To say that a particular global risk is endurable is evidently not to say that it is acceptable or not very serious. A world war fought with conventional weapons or a Nazi-style Reich lasting for a decade would be extremely horrible events even though they would fall under the rubric of endurable global risks since humanity could eventually recover. (On the other hand, they could be a local terminal risk for many individuals and for persecuted ethnic groups.) I shall use the following definition of existential risks: Existential risk – One where an adverse outcome would either annihilate Earth-originating intelligent life or permanently and drastically curtail its potential. An existential risk is one where humankind as a whole is imperiled. Existential disasters have major adverse consequences for the course of human civilization for all time to come. 2 The unique challenge of existential risks Risks in this sixth category are a recent phenomenon. This is part of the reason why it is useful to distinguish them from other risks. We have not evolved mechanisms, either biologically or culturally, for managing such risks. Our intuitions and coping strategies have been shaped by our long experience with risks such as dangerous animals, hostile individuals or tribes, poisonous foods, automobile accidents, Chernobyl, Bhopal, volcano eruptions, earthquakes, draughts, World War I, World War II, epidemics of influenza, smallpox, black plague, and AIDS. These types of disasters have occurred many times and our cultural attitudes towards risk have been shaped by trial-and-error in managing such hazards. But tragic as such events are to the people immediately affected, in the big picture of things – from the perspective of humankind as a whole – even the worst of these catastrophes are mere ripples on the surface of the great sea of life. They haven’t significantly affected the total amount of human suffering or happiness or determined the long-term fate of our species. With the exception of a species-destroying comet or asteroid impact (an extremely rare occurrence), there were probably no significant existential risks in human history until the mid-twentieth century, and certainly none that it was within our power to do something about. The first manmade existential risk was the inaugural detonation of an atomic bomb. At the time, there was some concern that the explosion might start a runaway chain-reaction by “igniting” the atmosphere. Although we now know that such an outcome was physically impossible, it qualifies as an existential risk that was present at the time. For there to be a risk, given the knowledge and understanding available, it suffices that there is some subjective probability of an adverse outcome, even if it later turns out that objectively there was no chance of something bad happening. If we don’t know whether something is objectively risky or not, then it is risky in the subjective sense. The subjective sense is of course what we must base our decisions on.[2] At any given time we must use our best current subjective estimate of what the objective risk factors are.[3] A much greater existential risk emerged with the build-up of nuclear arsenals in the US and the USSR. An all-out nuclear war was a possibility with both a substantial probability and with consequences that might have been persistent enough to qualify as global and terminal. There was a real worry among those best acquainted with the information available at the time that a nuclear Armageddon would occur and that it might annihilate our species or permanently destroy human civilization.[4] Russia and the US retain large nuclear arsenals that could be used in a future confrontation, either accidentally or deliberately. There is also a risk that other states may one day build up large nuclear arsenals. Note however that a smaller nuclear exchange, between India and Pakistan for instance, is not an existential risk, since it would not destroy or thwart humankind’s potential permanently. Such a war might however be a local terminal risk for the cities most likely to be targeted. Unfortunately, we shall see that nuclear Armageddon and comet or asteroid strikes are mere preludes to the existential risks that we will encounter in the 21st century. The special nature of the challenges posed by existential risks is illustrated by the following points: · Our approach to existential risks cannot be one of trial-and-error. There is no opportunity to learn from errors. The reactive approach – see what happens, limit damages, and learn from experience – is unworkable. Rather, we must take a proactive approach. This requires foresight to anticipate new types of threats and a willingness to take decisive preventive action and to bear the costs (moral and economic) of such actions. · We cannot necessarily rely on the institutions, moral norms, social attitudes or national security policies that developed from our experience with managing other sorts of risks. Existential risks are a different kind of beast. We might find it hard to take them as seriously as we should simply because we have never yet witnessed such disasters.[5] Our collective fear-response is likely ill calibrated to the magnitude of threat. · Reductions in existential risks are global public goods [13] and may therefore be undersupplied by the market [14]. Existential risks are a menace for everybody and may require acting on the international plane. Respect for national sovereignty is not a legitimate excuse for failing to take countermeasures against a major existential risk. · If we take into account the welfare of future generations, the harm done by existential risks is multiplied by another factor, the size of which depends on whether and how much we discount future benefits [15,16]. In view of its undeniable importance, it is surprising how little systematic work has been done in this area. Part of the explanation may be that many of the gravest risks stem (as we shall see) from anticipated future technologies that we have only recently begun to understand. Another part of the explanation may be the unavoidably interdisciplinary and speculative nature of the subject. And in part the neglect may also be attributable to an aversion against thinking seriously about a depressing topic. The point, however, is not to wallow in gloom and doom but simply to take a sober look at what could go wrong so we can create responsible strategies for improving our chances of survival. In order to do that, we need to know where to focus our efforts. 3 Classification of existential risks We shall use the following four categories to classify existential risks[6]: Bangs – Earth-originating intelligent life goes extinct in relatively sudden disaster resulting from either an accident or a deliberate act of destruction. Crunches – The potential of humankind to develop into posthumanity[7] is permanently thwarted although human life continues in some form. Shrieks – Some form of posthumanity is attained but it is an extremely narrow band of what is possible and desirable. Whimpers – A posthuman civilization arises but evolves in a direction that leads gradually but irrevocably to either the complete disappearance of the things we value or to a state where those things are realized to only a minuscule degree of what could have been achieved. Armed with this taxonomy, we can begin to analyze the most likely scenarios in each category. The definitions will also be clarified as we proceed. 4 Bangs This is the most obvious kind of existential risk. It is conceptually easy to understand. Below are some possible ways for the world to end in a bang.[8] I have tried to rank them roughly in order of how probable they are, in my estimation, to cause the extinction of Earth-originating intelligent life; but my intention with the ordering is more to provide a basis for further discussion than to make any firm assertions. 4.1 Deliberate misuse of nanotechnology In a mature form, molecular nanotechnology will enable the construction of bacterium-scale self-replicating mechanical robots that can feed on dirt or other organic matter [22-25]. Such replicators could eat up the biosphere or destroy it by other means such as by poisoning it, burning it, or blocking out sunlight. A person of malicious intent in possession of this technology might cause the extinction of intelligent life on Earth by releasing such nanobots into the environment.[9] The technology to produce a destructive nanobot seems considerably easier to develop than the technology to create an effective defense against such an attack (a global nanotech immune system, an “active shield” [23]). It is therefore likely that there will be a period of vulnerability during which this technology must be prevented from coming into the wrong hands. Yet the technology could prove hard to regulate, since it doesn’t require rare radioactive isotopes or large, easily identifiable manufacturing plants, as does production of nuclear weapons [23]. Even if effective defenses against a limited nanotech attack are developed before dangerous replicators are designed and acquired by suicidal regimes or terrorists, there will still be the danger of an arms race between states possessing nanotechnology. It has been argued [26] that molecular manufacturing would lead to both arms race instability and crisis instability, to a higher degree than was the case with nuclear weapons. Arms race instability means that there would be dominant incentives for each competitor to escalate its armaments, leading to a runaway arms race. Crisis instability means that there would be dominant incentives for striking first. Two roughly balanced rivals acquiring nanotechnology would, on this view, begin a massive buildup of armaments and weapons development programs that would continue until a crisis occurs and war breaks out, potentially causing global terminal destruction. That the arms race could have been predicted is no guarantee that an international security system will be created ahead of time to prevent this disaster from happening. The nuclear arms race between the US and the USSR was predicted but occurred nevertheless. 4.2 Nuclear holocaust The US and Russia still have huge stockpiles of nuclear weapons. But would an all-out nuclear war really exterminate humankind? Note that: (i) For there to be an existential risk it suffices that we can’t be sure that it wouldn’t. (ii) The climatic effects of a large nuclear war are not well known (there is the possibility of a nuclear winter). (iii) Future arms races between other nations cannot be ruled out and these could lead to even greater arsenals than those present at the height of the Cold War. The world’s supply of plutonium has been increasing steadily to about two thousand tons, some ten times as much as remains tied up in warheads ([9], p. 26). (iv) Even if some humans survive the short-term effects of a nuclear war, it could lead to the collapse of civilization. A human race living under stone-age conditions may or may not be more resilient to extinction than other animal species. 4.3 We’re living in a simulation and it gets shut down A case can be made that the hypothesis that we are living in a computer simulation should be given a significant probability [27]. The basic idea behind this so-called “Simulation argument” is that vast amounts of computing power may become available in the future (see e.g. [28,29]), and that it could be used, among other things, to run large numbers of fine-grained simulations of past human civilizations. Under some not-too-implausible assumptions, the result can be that almost all minds like ours are simulated minds, and that we should therefore assign a significant probability to being such computer-emulated minds rather than the (subjectively indistinguishable) minds of originally evolved creatures. And if we are, we suffer the risk that the simulation may be shut down at any time. A decision to terminate our simulation may be prompted by our actions or by exogenous factors. While to some it may seem frivolous to list such a radical or “philosophical” hypothesis next the concrete threat of nuclear holocaust, we must seek to base these evaluations on reasons rather than untutored intuition. Until a refutation appears of the argument presented in [27], it would intellectually dishonest to neglect to mention simulation-shutdown as a potential extinction mode. 4.4 Badly programmed superintelligence When we create the first superintelligent entity [28-34], we might make a mistake and give it goals that lead it to annihilate humankind, assuming its enormous intellectual advantage gives it the power to do so. For example, we could mistakenly elevate a subgoal to the status of a supergoal. We tell it to solve a mathematical problem, and it complies by turning all the matter in the solar system into a giant calculating device, in the process killing the person who asked the question. (For further analysis of this, see [35].) 4.5 Genetically engineered biological agent With the fabulous advances in genetic technology currently taking place, it may become possible for a tyrant, terrorist, or lunatic to create a doomsday virus, an organism that combines long latency with high virulence and mortality [36]. Dangerous viruses can even be spawned unintentionally, as Australian researchers recently demonstrated when they created a modified mousepox virus with 100% mortality while trying to design a contraceptive virus for mice for use in pest control [37]. While this particular virus doesn’t affect humans, it is suspected that an analogous alteration would increase the mortality of the human smallpox virus. What underscores the future hazard here is that the research was quickly published in the open scientific literature [38]. It is hard to see how information generated in open biotech research programs could be contained no matter how grave the potential danger that it poses; and the same holds for research in nanotechnology. Genetic medicine will also lead to better cures and vaccines, but there is no guarantee that defense will always keep pace with offense. (Even the accidentally created mousepox virus had a 50% mortality rate on vaccinated mice.) Eventually, worry about biological weapons may be put to rest through the development of nanomedicine, but while nanotechnology has enormous long-term potential for medicine [39] it carries its own hazards. 4.6 Accidental misuse of nanotechnology (“gray goo”) The possibility of accidents can never be completely ruled out. However, there are many ways of making sure, through responsible engineering practices, that species-destroying accidents do not occur. One could avoid using self-replication; one could make nanobots dependent on some rare feedstock chemical that doesn’t exist in the wild; one could confine them to sealed environments; one could design them in such a way that any mutation was overwhelmingly likely to cause a nanobot to completely cease to function [40]. Accidental misuse is therefore a smaller concern than malicious misuse [23,25,41]. However, the distinction between the accidental and the deliberate can become blurred. While “in principle” it seems possible to make terminal nanotechnological accidents extremely improbable, the actual circumstances may not permit this ideal level of security to be realized. Compare nanotechnology with nuclear technology. From an engineering perspective, it is of course perfectly possible to use nuclear technology only for peaceful purposes such as nuclear reactors, which have a zero chance of destroying the whole planet. Yet in practice it may be very hard to avoid nuclear technology also being used to build nuclear weapons, leading to an arms race. With large nuclear arsenals on hair-trigger alert, there is inevitably a significant risk of accidental war. The same can happen with nanotechnology: it may be pressed into serving military objectives in a way that carries unavoidable risks of serious accidents. In some situations it can even be strategically advantageous to deliberately make one’s technology or control systems risky, for example in order to make a “threat that leaves something to chance” [42].

#### Defense doesn’t assume interactions of multiple simultaneous threats

Pamlin, 15 -- Dennis Pamlin, Executive Project Manager of the Global Risks Global Challenges Foundation, and Stuart Armstrong, James Martin Research Fellow at the Future of Humanity Institute of the Oxford Martin School at University of Oxford, Global Challenges Foundation, February, http://globalchallenges.org/wp-content/uploads/12-Risks-with-infinite-impact.pdf

If a safe artificial intelligence is developed, this provides a great resource for improving outcomes and mitigating all types of risk.585 Artificial intelligence risks worsening nanotechnology risks, by allowing nanomachines and weapons to be designed with intelligence and without centralised control, overcoming the main potential weaknesses of these machines586 by putting planning abilities on the other side. Conversely, nanotechnology abilities worsen artificial intelligence risk, by giving AI extra tools which it could use for developing its power base.587 Nanotechnology and synthetic biology could allow the efficient creation of vaccines and other tools to combat global pandemics.588 Nanotechnology’s increased industrial capacity could allow the creation of large amounts of efficient solar panels to combat climate change, or even potentially the efficient scrubbing of CO2 from the atmosphere.589 Nanotechnology and synthetic biology are sufficiently closely related 590 (both dealing with properties on an atomic scale) for methods developed in one to be ported over to the other, potentially worsening the other risk. They are sufficiently distinct though (a mainly technological versus a mainly biological approach) for countermeasures in one domain not necessarily to be of help in the other. Uncontrolled or malicious synthetic pathogens could wreak great damage on the ecosystem; conversely, controlled and benevolent synthetic creations could act to improve and heal current ecological damage.

#### Strong risk reduction key to prevent AI-driven extinction---it’s uniquely likely, but success solves every impact

Pamlin, 15 -- Dennis Pamlin, Executive Project Manager of the Global Risks Global Challenges Foundation, and Stuart Armstrong, James Martin Research Fellow at the Future of Humanity Institute of the Oxford Martin School at University of Oxford, Global Challenges Foundation, February, http://globalchallenges.org/wp-content/uploads/12-Risks-with-infinite-impact.pdf

Despite the uncertainty of when and how AI could be developed, there are reasons to suspect that an AI with human-comparable skills would be a major risk factor. AIs would immediately benefit from improvements to computer speed and any computer research. They could be trained in specific professions and copied at will, thus replacing most human capital in the world, causing potentially great economic disruption. Through their advantages in speed and performance, and through their better integration with standard computer software, they could quickly become extremely intelligent in one or more domains (research, planning, social skills...). If they became skilled at computer research, the recursive self-improvement could generate what is sometime called a “singularity”, 482 but is perhaps better described as an “intelligence explosion”, 483 with the AI’s intelligence increasing very rapidly.484 Such extreme intelligences could not easily be controlled (either by the groups creating them, or by some international regulatory regime),485 and would probably act in a way to boost their own intelligence and acquire maximal resources for almost all initial AI motivations.486 And if these motivations do not detail 487 the survival and value of humanity in exhaustive detail, the intelligence will be driven to construct a world without humans or without meaningful features of human existence. This makes extremely intelligent AIs a unique risk,488 in that extinction is more likely than lesser impacts. An AI would only turn on humans if it foresaw a likely chance of winning; otherwise it would remain fully integrated into society. And if an AI had been able to successfully engineer a civilisation collapse, for instance, then it could certainly drive the remaining humans to extinction. On a more positive note, an intelligence of such power could easily combat most other risks in this report, making extremely intelligent AI into a tool of great positive potential as well.489 Whether such an intelligence is developed safely depends on how much effort is invested in AI safety (“Friendly AI”)490 as opposed to simply building an AI.49

#### Scenario 2 is Spillovers:

#### Failure to address regulatory externalities devolve into fiefdoms that destroys Congressional capacity and causes factionalism

Finkel 19 [Jacob Finkel, J.D., Stanford Law School, June 2019 https://review.law.stanford.edu/wp-content/uploads/sites/3/2019/06/Finkel-71-Stan.-L.-Rev.-1575.pdf]

1. Compacts meet “Federalism 3.0”

In 2016, Heather Gerken delivered a wake-up call: “[O]ur operating system is outdated. . . . We need an intellectual frame for thinking about today’s federalism, Federalism 3.0.”122 Gerken’s work—which is by no means uncontroversial123—suggests that, as legal practitioners and scholars, we must choke back an instinctive aversion to spillover effects (jurisdictions affecting those nearby)124 and reject our innate desire for clear delineations such as nationalists versus federalists. Gerken and Ari Holtzblatt have suggested embracing the diverse conflicts operating today between states, outside interest groups, Congress, and the executive branch.125 These “[s]pillovers, in short, can help generate the democratic churn necessary for an ossified system to move forward.”126

Where do compacts fit in this tapestry of power plays? Although they do not enter Gerken and Holtzblatt’s analysis, they actually provide the key to an essential harm compacts pose.127 First, it is important to establish the correct frame of reference; as able federalism scholars have reminded us, “[f]ederalism must be understood as a means rather than an end.”128 States’ rights are not themselves the endpoint of federalism; rather, “their worth derives entirely from their utility in enhancing the freedom and welfare of individuals.”129 Gerken and Holtzblatt argue that the conflict we see around us is better suited to moving our democratic society forward than illusory, immediate progress in the direction we ourselves might choose to go.130 Taking that hypothesis further, what could be more immediate and convey the illusion of progress better than an interstate compact, executed without congressional approval, that shoves a block of states in the direction a majority of their citizens desire to see the nation as a whole move? Such efforts will almost axiomatically move faster if they need only the support of those states that already agree with them.

Yet the end result of such a process—a patchwork of opposing compacts on hot-button national issues from health care and gun control to the regulation of major nationwide dangers like the tobacco industry—harms both the uninvolved states and the very project of national unity that lies at the core of federalism itself.131 Further, the partitioning argument—that policymaking should return to the states when the federal government is gridlocked—rests on the notion that the states are the best division lines for such political decisionmaking. As scholarship has shown, the United States is riven at a more granular level132—why stop at state-level compacts? A conservative community in California’s Central Valley, for instance, would (if granted home rule powers) most likely prefer to adopt the policies favored in Wyoming and Idaho than those advanced by Democratic supermajorities in Sacramento.133 If individual self-determination becomes our only focus, the project of a pluralistic society crumbles into virtual impossibility.

2. Horizontal harms in practice

Nor is this merely a theoretical concern. Most of the major regulatory compacts in recent decades have been preceded by some effort to gain congressional approval before organizers resorted to a compact.134 Further, empirical studies have demonstrated that compacts are being used to replace, not complement, congressional action on national problems.135 Thus, compacts serve to supplant Congress when it chooses not to act, or when vetogates within the federal legislative process prevent action on a particular controversy. Moreover, this problem is growing. Rising polarization and decreasing congressional productivity form a pernicious cycle. When coupled with efforts toward wide-ranging compacts, these trends feed upon, and likely exacerbate, one another: An unproductive Congress incentivizes advocates to push for compacts as a more responsive alternative. This increasingly extracongressional focus of advocacy further weakens Congress’s capacity for effective legislation, reducing the pressure felt by members of Congress to act upon issues being handled instead by compacts.136

Averting this hypothetical outcome should not lead us to block all compacts. However, for those compacts most likely to cause such turmoil—those with national political aims—a commonsense safeguard would be a return to congressional oversight. Like-minded states would be prevented from bringing policy preferences they could not enact in Washington into implementation as a separate bloc. Of course, states are still free to legislate their policy preferences within their own borders, with possible repercussions in neighboring states.137 At times, such local or regional solutions will be the best answer—a reasoned solution surely will not require every compact to receive congressional approval. However, accepting congressional gridlock as inevitable and abandoning the national project for independent fiefdoms governed by the individual policy preferences of small groups of states has potentially grave consequences.138 The horizontal harm to be prevented is saving the states from themselves—if one believes as a normative matter that “[f]ederalism ought to exercise a centripetal rather than centrifugal force on the polity,”139 then the current permissibility of states forming their own preferred pseudo-national policies without congressional involvement, even in pursuit of laudable policy objectives, must be addressed.

#### Loss of Congressional capacity causes extinction

Mead 15 [Walter Russell Mead, Professor of Foreign Affairs and the Humanities at Bard College, Distinguished Scholar in American Strategy and Statesmanship at the Hudson Institute, 10-22-15 http://www.hudson.org/research/11818-global-challenges-u-s-national-security-strategy-and-defense-organization]

Filled with opportunity as it is, the new century also contains threats: conventional threats like classic geopolitical rivals struggling against the world order favored by the United States and its allies, unconventional threats like terror movements spurred by jihadi ideology, regional crises like the implosion of much of the Middle East and a proliferation of failed and failing states, emerging threats like the danger of cyber war, and systemic problems like the crises in some of the major institutions on which the global order depends — NATO, the EU, and the UN for example. The United States government itself is not exempt from this problem; whether one looks at the Pentagon, the Department of Homeland Security or the State Department one sees organizations seeking to carry out 21st-century missions with 20th or even 19th-century bureaucratic structures and practices.

Additionally, the United States faces a challenge of strategy. While the United States has enough resources to advance its vital interests in world affairs, it does not have the money, the military power, the know how or the willpower to address every problem, intervene in every dispute, or to dissipate its energies in futile pursuits.

The United States faces an array of conventional and unconventional threats, as well as several systemic dangers. Our three principal conventional challengers are China, Russia, and Iran. All aim to revise the current global geopolitical order to some extent. In the years to come, we must expect that revisionist powers will continue to challenge the existing status quo in various ways. Moreover, the continuing development of “second generation” nuclear weapons states like Pakistan ensures that geopolitical competition between regional powers can trigger global crises.

Meanwhile, we are also confronted by an array of unconventional threats. Despite the fondest hopes of many Americans, Sunni jihadism has not proven to be a passing phase or fringe movement. Al-Qaeda was more resourceful and ambitious than the previous generation of radical salafi groups; its Mesopotamian offshoot (AQIM) was still more effective; today, ISIS has leaped ahead to develop capabilities and nourish ambitions that earlier jihadi groups saw only in their dreams. Unfortunately, the radical movements have lost inhibitions as they gained capacities. Wholesale slaughter, enslavement, barbaric and spectacular forms of execution: these testify to a movement that becomes more depraved, more lost in the pornography of violence, even as it acquires more resources and more fighters. This movement could become significantly more dangerous before it begins to burn out.

Yet radical jihadis may well prove to be less of a threat than the emerging dangers of the cybersphere. Cyber conflict is a new arena of action, one in which non-state, quasi-state and state actors are all present. With almost every day bringing stories of utterly lamentable failures of American cyber security, it must be clearly said that the U.S. government has allowed itself to be made into a global laughingstock even as some of our most vital national security (and corporate and personal) information is captured by adversaries with, apparently, impunity.

But problems like these are pinpricks compared to the damage that cyber war can cause. Not only can industrial sabotage disrupt vital systems, including military command and control systems as well as, for example, the utilities on which millions of Americans depend for their daily necessities, cyberwar can be waged anonymously. Threats of retaliation lose their deterrent power when the attacker is unknown. Worse, the potential for destabilizing first strikes by cyber attacks will complicate the delicate balance of terror, and leaders could find themselves propelled into conflict. Cyber war could accelerate the diplomatic timetable of the 21st century much as railroad schedules and mobilization timetables forced the hands of diplomats in 1914.

Beyond that, one can dimly grasp the possibility of biologically based weapons as a new frontier in human conflict. It is far too soon to know what these will be like or how they will be used; nevertheless one must postulate the steady arrival of new kinds of weapons, both offensive and defensive, as the acceleration of human scientific understanding gives us greater access to the wonders of the life sciences.

Finally, there are systemic or generic threats, which is to say, dangers that are not created by hostile design, but emerge as byproducts from existing and otherwise benign trends that are likely to pose significant challenges to the United States’ interests and security in coming decades. We do not usually think of these as security problems, but they can create or exacerbate security threats and they can degrade our abilities to respond effectively.

For all its promise, the tech revolution entails an accelerating rate of change in human communities that has destabilizing effects. In the U.S., and especially in Europe, these take the relatively benign, but still problematic, form of the breakdown of what I have called the “blue social model”—a tightly integrated economic-social model built during the 21st century that linked lifetime employment and fixed pensions into a socio-economic safety net. Now, the structures that were designed to secure prosperity and economic safety in the 20th century are often constraining it in the 21st.

But elsewhere, the strains of the modern economy may yet be worse, and produce more malign results. In the Middle East and North Africa, government institutions and systems of belief are overwhelmed by the onslaught of modernity. For better or worse, the pressures of modernity will increase on societies all around the world as we move deeper into the 21st century. To date, the United States has demonstrated very little ability to help failed or failing states find their feet. Failing states provide a fertile environment for ethnic and religious conflict, the rise of terrorist ideologies, and mass migration. The United States will need to be ready to deal with the fallout – fallout that in some cases could be more than metaphorical.

Finally, the United States and its allies must recognize and overcome a crisis of confidence. The West’s indecision, weak responses, mirror imaging of strategic competitors who do not share our values, and our tendency to rely upon process-oriented “solutions” in the face of growing, violent threats have encouraged a paradox: our enemies and challengers have become more emboldened, and disruptive to the world order, exploiting the opportunities that the open order supported by the United States and its allies provides.

Western societies have turned inward, susceptible to “there’s nothing we can do” and “it’s not our problem” political rhetoric. As history shows, the combination can carry a very high cost and take many years to unwind. Grand strategy has to take this into account: American leadership is critical to highlighting and thwarting problems that may fester into major global threats. Even the best strategic planning and the best procurement of equipment to meet serious strategic threats is insufficient should current Western leaders lack the wit to recognize and the will to meet challenges as they arise.

Recommendations

What can the United States Congress and the armed services do to prepare the country for the strategic challenges of the future? The Committee invited me to look beyond the day to day problems and to take a longer view. Here are some thoughts:

1. Invest in the future.

The apparently inexorable acceleration of technological and social change has many implications for the armed services of the United States. It is not just that weapons and weapon platforms must change with the times, and that we must continue to invest in the research and development that will enable the United States to field the most advanced and effective forces in the world. Technological change drives social change, and conflict is above all a social activity. Military forces must develop new ways of organizing themselves, learn to operate in different dimensions, understand rapidly-changing cultural and political forces and generally remain innovative and outward focused.

New tech does not just mean new equipment on the battlefield. As tech moves into civil life, the structure of societies change. Insurgencies mutate as new forms of communication and social organization transform the ways that people interact and communicate.

The need for flexibility is heightened by the diversity of the world in which the Armed Forces of the United States, given our country’s global interests, must operate. American forces must be ready to work with Nigerian allies against Boko Haram, maintain a base presence in Okinawa while minimizing friction with the locals, operate effectively in the institutional and bureaucratic culture of the European alliance system, while killing ruthless enemies in the world’s badlands. Our combat troops must work in a high tech electronic battlefield of the utmost sophistication even as they work to win the hearts and minds of illiterate villagers.

The armed services must continue to reinvent themselves to fit changing times and changing missions, and they must be given the resources and the flexibility necessary to evolve with the world around them. The bureaucratic routines of Pentagon business as usual will be poorly adapted the kind of world that is growing up around us. A focus on re-imagining and re-engineering bureaucratic institutions is part of investing in the future. Private business has often moved more quickly than government bureaucracy to develop new staffing and management patterns for a more flexible and rapidly changing environment. Government generally, and the Pentagon in particular, will need aggressive prodding from Congress to adapt new methods of management and organization. Investment in better management and organizational reform will be vital.

#### Factionalism causes adversary probing that collapses security

Mitchell 20 [Ellen Mitchell, Military reporter for Inside Defense. Aviation, missile and network modernization reporter for Inside the Army until February 2016. She covered programs, budget and congressional action related to Army aircraft, JTRS radios, WIN-T, vehicles, UAS, unmanned ground vehicles and training and doctrine command. The Hill. 11-7-2020 https://thehill.com/policy/defense/524894-worries-grow-about-rudderless-post-election-pentagon]

Right now, Washington is grappling with hot spots across the globe, including the U.S. drawdown in Afghanistan, where there is increasing violence; ongoing tensions with Iran; and ramped-up Chinese aggression in the South China Sea.

National security experts say uncertainty at home could lead to flare-ups in any one of those regions.

“Of course adversaries will try to take advantage of what they perceive to be a leadership vacuum in the U.S. national security establishment. I’d be more worried about just below-the-radar bad behavior than overt moves too,” said Mackenzie Eaglen, a former congressional adviser on defense now with the conservative American Enterprise Institute.

Defense Secretary Mark Esper — who has long been seen as out the door regardless of who won the election — may be gone as early as next week, according to numerous reports. Esper is already expected to resign during the presidential transition, but sources have also said Trump plans to fire his Pentagon chief after the election results are in.

Esper’s vacancy, which would be filled in an acting capacity by Deputy Secretary of Defense David Norquist, would offer a window for U.S. enemies to probe America's defenses, according to Eaglen.

“The Defense Department is one of the largest organizations in the world, with over 3 million people on the direct payroll. It needs strong leaders keeping vigilant watch with the troops and over our adversaries,” she said.

She added that at this time, with the possibility of a highly charged presidential transition as the whole world watches, “it would be ideal for continuity at the top.”

It is not uncommon for U.S. foes to take advantage of turmoil. When America and the rest of the world were preoccupied with the fight against the coronavirus pandemic this spring, Russia, China, Iran and North Korea all moved to test U.S. defenses.

But Washington is now heading toward a tumultuous transfer of power on top of tackling several pressing national security issues.

The U.S. is currently dealing with a drawdown of most U.S. troops in Afghanistan by next spring while brokering a peace deal with the Taliban, countering Chinese militarization in the South China Sea and addressing the ongoing threat of Iran to U.S. forces in Iraq.

Retired Lt. Gen. Thomas Spoehr, a defense expert at the conservative Heritage Foundation, said that while he could potentially see Russia or a China attempting to take advantage of any U.S. tumult, it wouldn’t be due to Pentagon leadership being in flux.

Rather, “it would be more a fact of the entire U.S. society kind of in a turbulent time and preoccupied with internal matters versus a perception that the Pentagon wouldn’t quickly respond,” Spoehr told The Hill.

#### That goes nuclear

Klare 19 [Dr. Michael T. Klare, Professor Emeritus of Peace and World Security Studies at Hampshire College and Senior Visiting Fellow at the Arms Control Association, Ph.D. from the Graduate School of the Union Institute, BA and MA from Columbia University, “Cyber Battles, Nuclear Outcomes? Dangerous New Pathways to Escalation”, Arms Control Today, November 2019, https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation

The first and possibly most dangerous path to escalation would arise from the early use of cyberweapons in a great power crisis to paralyze 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 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 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. 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 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 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

#### The Court has recently narrowed Parker immunity to limit deference to the states in antitrust law

Allensworth 16 [Rebecca Haw Allensworth, Associate Professor of Law, Vanderbilt Law School; J.D., Harvard Law School; M.Phil, University of Cambridge; B.A., Yale University, October 2016, ARTICLE: THE NEW ANTITRUST FEDERALISM, 102 Va. L. Rev. 1387]

Introduction

IN just three relatively obscure antitrust cases, 1

[Footnote 1] N.C. State Bd. of Dental Exam'rs v. FTC, 135 S. Ct. 1101 (2015) [hereinafter NC Dental]; FTC v. Phoebe Putney Health Sys., Inc., 133 S. Ct. 1003 (2013); FTC v. Ticor Title Ins. Co., 504 U.S. 621 (1992).

the U.S. Supreme Court has quietly revolutionized how states and the federal government share power. These cases addressed a doctrine - unfamiliar to those outside of the field of antitrust law - that grants "state action" immunity from federal antitrust liability 2 and thus marks the thin line that insulates state regulation from wholesale invalidation through federal antitrust lawsuits. 3 For decades, the Court conceived of this line, and the "antitrust federalism" it effected, as a formal question about where the state ended and antitrust liability began. This was the old antitrust federalism: a boundary-drawing exercise that gave strong deference to state regulation. The Court's state action revolution ushers in a new antitrust federalism, one that all but dispenses with the notion of separate spheres in favor of something less deferential to the states - procedural review of state regulation.

Antitrust federalism may be less familiar than its constitutional cousin, but it is just as important - if not more so - to the state-federal balance of power. The Sherman Act forbids anticompetitive restraints of trade and monopolization of markets, and it does not seem to limit these prohibitions to private citizens and corporations. 4 Because regulation often tinkers with the free market economy and tends to create competitive winners and losers, Sherman Act liability for state conduct would severely restrict a state's ability to regulate within its borders. 5 So when [\*1390] the Court extended the reach of the Sherman Act - along with all federal regulation passed under the Commerce Clause - during the New Deal, 6 it became necessary to define an exemption for "state action" or risk the demise of state regulatory autonomy altogether. And state action immunity from the Sherman Act was born. 7

#### But, the current interpretation fails to account for interstate spillovers. Limiting Parker is crucial to establish federal role limiting regulatory externalities

Sack 21 [John Sack, J.D., Duke Law School, Class of 2022, B.S. University of Michigan, 2019, 2021 https://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=1196&context=djclpp\_sidebar]

III. DOCTRINAL CRITICISM

Although the Court has continued to re-affirm Parker v. Brown’s central holding, many have criticized the Parker doctrine. Both scholars and the Federal Trade Commission (FTC) have highlighted problems with the doctrine and offered a number of solutions for how to remedy its faults.63

The first common critique of the doctrine is that it does not account for out-of-state economic effects. Unless a regulation runs afoul of another constitutional barrier, no consideration of interstate spillovers applies.64 One need not look farther than Parker itself to see how the state action doctrine can impose costs on out-of-state residents, even though those residents have diminished political capital in the state. At the time Parker was decided, between 90 and 95 percent of raisins produced in California entered interstate commerce and California provided almost all of the nation’s raisins.65 Most American raisin consumers lived outside of California and had no political means to oppose the state’s legislative program, yet they bore the costs of California’s state-sanctioned monopoly.66

Second, similar concerns about political representation animate critiques of Parker immunity. The policy at issue in Parker restricted output and artificially raised prices, two results federal antitrust law generally seeks to prohibit.67 Although the benefits of such a program were borne almost exclusively by California, the costs of the program were incurred by raisin consumers across the nation.68 The political incentives to promote such a program follow closely with economic costs and benefits.69 California raisin producers have a strong incentive to lobby their own government to install such a program, but it would be nearly impossible for non-California residents to challenge such a policy through the normal political channels.70 The government of California is not the appropriate body to properly weigh the benefits to in-state raisin producers with the costs to out-of-state consumers, yet the Parker doctrine grants California per se immunity on federalism grounds.71 Although the California program was implicitly endorsed by Congress, one is just as likely to find similar programs with no similar implicit endorsement.72

The U.S. Constitution embodies a system of federalism where the federal government is sovereign in some respects, and the several states are sovereign in others.73 This system of federalism gives states the power to regulate local matters and the federal government the power to regulate issues that states are less suited to regulate.74 When costs spill over into other states, the national government becomes the appropriate body to regulate the costs and benefits of such a program.75 The Court has recognized such spillover effects, and how political actors, even government entities, can act solely in self-interest.76 Such state self-interest can directly harm consumers outside of its territorial jurisdiction.77

Parker immunity, as it stands, runs counter to longstanding ideals of national unity that harken back to the Founding era. The law has long prohibited states from imposing excessive costs on the nation as a whole, solely for the purpose of furthering its own intrastate policy interests. McCulloch v. Maryland illustrates the Court’s wariness of self-serving state action.78 In McCulloch, Chief Justice Marshall held that states may not tax the national bank, as they would be wielding power against the whole of the United States, even though the whole of the United States is not represented by each state.79 Similar to a state tax being problematic since it is the part acting on the whole, anticompetitive restraints by the states would unduly impose costs on the nation. The people of the United States, acting through Congress, christened competition and free markets through the Sherman Act.80 Just as one state could not tax the resources of the United States, one state should not be allowed to use state policy to burden the national economy. Because the potential costs to state-created monopolies are so high,81 federal policy should prohibit states from allocating those costs beyond their borders. Any state that wishes to impose monopoly costs outside of its borders to benefit itself and undermine competition should be carefully scrutinized when it does so. This scrutiny would not be fatal-in-fact for the legislation, but it should be enough for states to second-guess an attempt to enrich itself to the detriment of its sister states.

IV. PROPOSED SOLUTIONS

The Sherman Act, and specifically Parker immunity, should be interpreted in light of the above concerns. After all, the Sherman Act is the standard-bearer for the U.S. free market system, and so our interpretation of it should evolve with our understanding of constitutional principles and economic conditions.82 Justice Burger’s concurrence in City of Lafayette elaborates on this point:

Our conceptions of the limits imposed by federalism are bound to evolve, just as our understanding of Congress’ power under the Commerce Clause has evolved. Consequently, since we find it appropriate to allow the ambit of the Sherman Act to expand with evolving perceptions of congressional power under the Commerce Clause, a similar process should occur with respect to “state action” analysis under Parker. That is, we should not treat the result in the Parker case as cast in bronze; rather, the scope of the Sherman Act’s power should parallel the developing concepts of American federalism.83

As states impose costs on each other through state-sanctioned monopolies, the Court’s understanding of federalism and the Commerce Clause counsels scrutiny of the Parker doctrine. An entirely new doctrine is not necessary to curtail Parker immunity. Rather, the issue can be resolved by applying Parker immunity in light of the American dual system of federalism and the Commerce Clause. Modern scholarship critiques the lack of concern for interstate spillovers. By that token, the modern Parker doctrine fails to account for economic efficiency and undermines political representation values meant to be protected by federalism.84 So while scholars almost universally recognize that interstate economic spillovers are problematic, there is no consensus on what remedy is most appropriate.

#### The aff preserves state authority to enforce antitrust but absent clarification on the transboundary effects from broad Parker immunity turf wars cause enforcement failures

Kobayashi 20 [Bruce H. Kobayashi, George Mason University, Antonin Scalia Law School Professor, 10-4-2020 https://gaidigitalreport.com/2020/10/04/exemptions-and-immunities/#\_ftn92]

B. Spillover Effects and Antitrust Federalism

The current state action doctrine does not enable jurisdictional competition or promote the principles of federalism because it does not account for the spillover effects of anticompetitive state regulation. Judge Easterbrook examined the Court’s state action holdings and found that the Court’s rulings were indifferent as to whether the effects of the regulation were actually internalized by the regulating state.[91] Allowing states to enact anticompetitive legislation reduced the extent and effectiveness of competition among the states, and thereby increased the cost of exit and relocation.[92]

This nature of the spillover effect is exemplified in Parker v. Brown.[93] The state action doctrine was used to uphold a California regulation which authorized a raisin cartel. California raisin growers benefited greatly from that ability to price fix. However, over 90% of the grapes were exported outside of California—nationally and internationally—making the impact of the California raisin regulation reach beyond state lines.[94] The regulation harmed a large number of consumers outside of California while only benefiting a small number of private interest parties within the state.

State action doctrine, although meant to preserve that state’s independence, actually allows the state to reap the benefits of the anticompetitive regulation while displacing the costs onto other states.[95] Therefore, it is worth considering if the current state action doctrine should be thought of differently, in a way that fully takes into accounts issues of federalism. Judge Easterbrook proposes a state action rule which considers the spillover effect of anticompetitive state regulation. Instead of examining clear articulation and active supervision, the Court would uphold an anticompetitive state regulation as long as its anticompetitive effects are internalized by that state’s residents.[96] Aligning state action doctrine with the economics of federalism will not only maintain states’ roles in antitrust, but also ensure that state antitrust exemptions have a diminished negative impact on consumer welfare. Analyzing the anticompetitive overcharge of regulations is also more administrable than attempting to analyze the regulations under the dormant Commerce Clause.[97] Considered under Easterbrook’s approach, Parker’s California raisin prorate program would be subject to antitrust scrutiny because the regulation’s costs were not internalized.

State regulation of seemingly local competition is likely to effect more than just the economy of that specific state. When states grant antitrust immunities in situations involving interstate commerce, the state is exporting the anticompetitive effects of its regulations to citizens outside its own borders. Without accounting for the federal interest in an integrated national economy, state action doctrine far surpasses its narrow purpose of supervising local competition.

C. The Appropriate Role of State Attorneys General in Federal Antitrust Disputes

Federalism most often refers to the vertical relationship between the federal government and the states. Divergent viewpoints among antitrust enforcers can strain the system, thus comity and deference are crucial to efficient antitrust enforcement. A merger or acquisition is often scrutinized by multiple enforcers with multi-dimensional relationships.

For example, the Sprint/T-Mobile merger involved the Antitrust Division and Federal Communications Commission, who share a horizontal relationship, and state attorneys general, with which the federal agencies share a vertical relationship. Disagreement between enforcers may occur at either level.[98] The merger between the two telecommunications firms was cleared by the FCC, the Antitrust Division, and ten state attorneys general.[99] Although a settlement agreement—which required divestitures—was in the process of being approved, several other state attorneys general filed a lawsuit to block the merger anyway.[100] Assistant Attorney General Makan Delrahim questioned the relief sought by the states,[101] citing the federal agencies’ expertise in the matter.[102] He noted that “a minority of states and the District of Columbia” were “trying to undo [the nationwide settlement],” a situation he believed was “odd.”[103] Delrahim reaffirmed states’ rights to sue for antitrust violations but criticized their attempt to seek relief inconsistent with the federal government’s settlement.[104]

States may also enter settlement agreements with merging parties that are repugnant to sound antitrust enforcement. For example, in UnitedHealth Group/Sierra Health Services, the Nevada Attorney General required the merged firm to submit $15 million in charitable contributions which were not related to any antitrust violation.[105] Similarly, Massachusetts entered a settlement agreement with two hospitals that required increased spending on select programs and the creation of other projects and programs unrelated to antitrust concerns.[106]

On the other hand, state antitrust enforcement can play a useful role in supplementing federal antitrust enforcement. First, the use of state autonomy within a federal system allows state and local governments to act as social “laboratories,” where laws and policies are created and tested at the state level of the democratic system, in a manner similar (in theory, at least) to the scientific method.[107] Thus, even if states enter into agreements with merging parties that the federal authorities view as anticompetitive or that impose ineffective remedies for the anticompetitive effects that would be generated by the merger, the information generated by such actions can be invaluable inputs into retrospective analyses of the competitive effects of mergers. These analyses are based on causal empirical designs which require both observation of post-merger price and quality effects from consummated mergers and the ability to compare these effects with a credible control group.[108] For example, state interventions such as COPA or Certificate on Need Laws that allow hospital mergers that generate competitive effects in local geographic markets facilitate retrospective studies of hospital mergers that can be used to validate and improve the economic models and other tools used to predict merger effects.[109]

Second, in a system of federalism, the state enforcement of both the state and federal antitrust laws can be a valuable complementary resource that supplements scarce federal resources. Conflicts between the federal and state antitrust authorities are generated by the use of a cooperative or “marble cake” approach to federalism, where the tasks of the state and federal agencies are relatively undefined, overlapping, and imperfectly coordinated. In contrast, a “dual” or “layer cake” federalism approach, where power is divided ex-ante between the federal and state governments in clearly defined terms, can mitigate direct conflicts between state and federal authorities discussed above.

#### Failure to hold states accountable for spillovers destroys optimal state experimentation – correctly “right sizing” regulation impossible without accounting for externalities in interjurisdictional competition

Adler 20 [Jonathan H. Adler, Case Western University School of Law, 2020 <https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=3058&context=faculty_publications>]

The race-to-the-bottom theory presumes that interjurisdictional competition creates a prisoner’s dilemma for states. Each state wants to attract industry for the economic benefits that it provides. Each state also wishes to maintain an optimal level of environmental protection. However, in order to attract industry, the theory holds, states will lower environmental safeguards so as to reduce the regulatory burden they impose upon firms. This competition exerts downward pressure on environmental safeguards as firms seek to locate in states where regulatory burdens are the lowest, and states seek to attract industry by lessening the economic burden of environmental safeguards. Because the potential benefits of lax regulation are concentrated among relatively few firms, these firms can effectively oppose the general public’s preference for environmental protection regulation. This will lead to social welfare losses even if environmental harm does not spill over from one state to another. The result, according to the theory, is the systematic under-regulation of environmental harms, and a need for federal intervention.26

The race-to-the-bottom theory may have had some basis in the 1960s and 1970s, but there is little reason to believe that this dynamic inhibits state regulatory efforts today, particularly given how aggressive many states are in environmental policy. Empirical evidence that states race to relax their environmental regulations in pursuit of outside investment is decidedly lacking. If the prospect of interstate competition discourages state-level environmental regulation, it is hard to explain why state environmental regulation often preceded federal intervention and why many states adopt more stringent measures than federal regulations require. Numerous studies have been conducted attempting to determine whether a race-to-the-bottom can be observed in the context of environmental regulation, and they have generally failed to find any evidence that environmental quality worsens when states are given more flexibility to set their own priorities.27 Indeed, some studies have \found precisely the opposite: that when states have more flexibility to set their own environmental priorities they increase their efforts.28

None of the above should be taken as an argument against all federal environmental regulation. For just as the federal government is overly interventionist in localized environmental concerns, the federal government is unduly absent in areas where a federal presence is most necessary. That is, the undue centralization of some environmental concerns co-exists with substantial federal abdication from concerns the federal government should be addressing. The federal government devotes relatively little of its regulatory resources on those matters for which the federal government possesses a comparative advantage and abdicates its responsibility to provide the data and knowledge base necessary for successful environmental regulation at all levels of government.

It is often remarked that environmental problems do not respect state borders. This is unquestionably true, and the observation provides ample justification for federal measures to address transboundary pollution problems.29 Where pollution or other environmental problems span jurisdictional borders there is less reason to believe state and local jurisdictions will respond adequately.

Consider a simple transboundary pollution problem involving two states, A and B. When economic activity in State A causes pollution in State B, State A is unlikely to adopt measures to prevent the resulting environmental harm because it would bear the primary costs of any such regulatory measures, without capturing the primary benefits. Put simply, State A is unlikely to impose costs on itself to benefit State B. Absent some external controls or dispute resolution system, the presence of interstate spillovers can actually encourage polices that externalize environmental harms, such as subsidizing development near jurisdictional borders so as to ensure that environmental harms fall disproportionately “downstream.” Policymakers in State B may wish to take action, but they will be unable to control pollution created in State A without State A’s cooperation. Even where polluting activity imposes substantial environmental harm within State A, the externalization of a portion of the harm is likely to result in the adoption of less optimal environmental controls.

#### Biden’s XO empirically denies any FTC Parker links and more restrictions coming

Bulusu 21 [Siri Bulusu, Reporter Bloomberg Law, 7-12-2021 https://news.bloomberglaw.com/antitrust/worker-license-rules-emerge-as-ftc-competition-oversight-priority]

President Joe Biden’s order, signed Friday, calls on the Federal Trade Commission to boost labor market competition by writing new rules that limit “unnecessary, cumbersome” licensing requirements, often imposed by states’ regulatory boards and quasi-public organizations.

“Some overly restrictive occupational licensing requirements can impede workers’ ability to find jobs and to move between states,” according to the order. The order comes amid a flurry of lawsuits against state or state-backed licensing bodies that accuse them of violating antitrust law by imposing expensive fees or threatening to shut down out-of-state businesses. The text of the order didn’t include specific directions for federal antitrust agencies. But the FTC’s anticipated actions and possible rulemaking could lead to streamlined licensing requirements across states, eliminating demands for worker information unrelated to the job, enforcement of interstate commerce rules, and levying of punitive fines, market watchers say. Licenses are expensive and requirements vary among states, even in the same industry. Reining in the requirements could remove a significant employment barrier, particularly for military families and others who frequently move between states or offer services across state lines. But it also could shift states’ calculations in cracking down on frauds and impostors. Cosmetology licenses can cost up to $15,000 and sometimes years of study, said Dick Carpenter, a senior director of strategic research for the Institute for Justice. Other jobs, ranging from public health and safety positions to interior designers, barbers, and manicurists, also require licensing. “Without any kind of standardization of different licensing requirements—even if you have the same requirements in different jurisdictions—you still have to get a license for each jurisdiction, which impedes an employee’s ability to be mobile,” said Tracey Diamond, a partner at Troutman Pepper LLP’s labor and employment practice.

Potential FTC Moves

The FTC’s options include writing new rules or heightening enforcement of interstate commerce rules in areas where they overlap with antitrust violations, labor market watchers say. Under this principle, restricting labor through onerous licensing requirements would be tantamount to limiting movement of services across borders.

“In the past, occupational licensing was a matter overseen by the Department of Labor, but they don’t quite have the teeth that the Federal Trade Commission has in terms of working in specific locations,” said Morris Kleiner, a University of Minnesota professor of labor policy.

The FTC could turn its limited resources toward scrutinizing occupational licensing programs that narrow the practice scope of a certain profession and limit competition, Kleiner said.

How the commission interprets which licensing requirements are “unnecessary” could be scrutinized. Those could include common requirements such as citizenship and a clean criminal record, said Bobby Chung, a postdoctoral research associate at the University of Illinois at Urbana-Champaign who focuses on licensing. .

“The required training, education and exams should confer the relevant skill sets,” Chung said. “If not, I would regard those requirements as unnecessary.” The agency also may impose specific guidelines that limit fees or frequency of license renewal, Kleiner said. “But more importantly, the FTC’s guidelines could be aimed specifically at states that have ratcheted up their requirements,” he said.

Gaining Attention

Burdensome licensing requirements have increasingly come under federal scrutiny as the labor market has shifted away from manufacturing jobs to service-oriented professions. States began imposing licensing requirements in order to protect consumers from bad actors and standardize services. “Licenses create a monopoly of workers who can provide a service,” Kleiner said. “But if you provide those services without a license, the police powers of the state can arrest and severely fine those individuals.” In 2020, roughly 23% of workers were required to have a license, according to the Bureau of Labor Statistics. Over the years, many states, including Arizona, Connecticut, Nebraska, and Tennessee, have modified their rules to lower what they considered to be burdensome barriers to obtaining licenses. Biden’s move is part of states’ broader push for changes, Carpenter said. “There is a momentum building to raise awareness to the issue.” Advocates for change also cite underemployment and unemployment stemming from the burdensome licensing requirements, as well as allegations that certain industries create occupational licensing to limit competition. Immigrants also can be affected by the licensing requirements, particularly if they hold foreign degrees but are performing lesser-skilled jobs in the U.S., according to a 2017 study by the Migration Policy Institute. Licensing particularly hurts foreign nationals with temporary work visas whose immigration status impedes them from seeking a license to work within their specialty, Chung said. That in turn impedes their path to permanent residency or citizenship, he said.

State Action

The FTC has struggled to rein in licensing practices with antitrust violations partly because public entities, like state-controlled licensing boards, can claim state action immunity. Such immunity authorizes a state to carry out certain legitimate government functions, often in regulated industries that require licensing.

“Many of these state certifications don’t violate antitrust law and that’s because of this doctrine that displaces antitrust law,” said Jesse Markham, a partner at Baker & Miller PLLC’s San Francisco office. “And that’s why these certification requirements exist with impunity.”

In 2015, the Supreme Court ruled in North Carolina State Board of Dental Examiners v. FTC that the state board was operated by market participants. Without active supervision from the state, the board couldn’t claim state action immunity from federal antitrust actions.

The ruling unleashed “dozens of lawsuits"—seeking antitrust treble damages—against individual members of licensing boards, according an October 2020 statement from Reps. Mike Conaway (R-Texas), Jamie Raskin (D-Md.), and David Cicilline (D-R.I.) in support of a bill they introduced to shield board members from such suits.

Qualifying for state action immunity largely depends on whether a board is a true government actor or a private market participant. But this delineation becomes more complex if there’s a blurred line between a state agency handling its own actions or a private group acting under state guidance.

How the FTC handles that blurred line will be one issue the agency tackles as it implements the president’s order.

#### Court rulings on Parker empirically deny disad links

Grossman 15 [Jonathan M. Grossman, co-chair at Cozen O’Connor, Harvard Law School, J.D., 2000, 2-25-2015 https://www.cozen.com/news-resources/publications/2015/supreme-court-delivers-another-blow-to-state-action-antitrust-immunity]

Supreme Court Delivers another Blow to State Action Antitrust Immunity

Today’s Supreme Court decision in North Carolina State Board of Dental Examiners v. Federal Trade Commission1 is the second time in two years that the Court has spoken on the state action exemption to the federal antitrust laws, and the Court once again has made it clear that the days of an expansive interpretation of that exemption are over.

Under the state action exemption, which is based on the principles of state sovereign immunity, restraints imposed by a state as an act of government are exempt from federal antitrust laws. Parker v. Brown, 317 U.S. 341 (1943). Private parties carrying out a state’s regulatory program are also immune as long as the private party: 1) is acting pursuant to a “clearly articulated and affirmatively expressed … state policy;” and 2) is “actively supervised by the state itself.” Cal. Retail Liquor Dealers Ass'n v. Midcal Aluminum, 445 U.S. 97 (1980).

Today’s decision in NC Dental and the 2013 Supreme Court decision in Phoebe Putney2 each focused on one of the two prongs of the Midcal test, and each decision will have the effect of making it more difficult to extend the exemption beyond the state itself.

In NC Dental, the Court focused on the “active supervision” requirement and concluded that the North Carolina Board of Dental Examiners (the Board) did not meet that test. The controversy began in 2003 when non-dentists in North Carolina began to offer teeth-whitening services. The Board, which is designed as a state agency by statute, consisted of six licensed dentists, one licensed dental hygienist, and one consumer member; with the dentists and dental hygienists elected by their peers and the consumer member appointed by the governor of the state. The Board issued nearly 50 cease-and-desist letters to non-dentist providers that effectively resulted in the end of non-dentists providing teeth-whitening services in the state. In 2010, the Federal Trade Commission (FTC) issued an administrative complaint against the Board alleging that it had violated the FTC Act by excluding the non-dentist teeth-whitening providers. The Board argued that it was acting as a state agency and thus immune from federal antitrust laws. The FTC issued a final order against the Board and enjoined it from issuing further extrajudicial orders to teeth-whitening providers in North Carolina. The 4th Circuit denied the Board’s subsequent petition seeking review of the FTC order.3

In affirming the 4th Circuit decision, the Supreme Court held that a state board on which a controlling number of decision makers are active market participants in the occupation the board regulates must satisfy Midcal’s active supervision requirement in order to invoke antitrust immunity under the state action exemption. The Court noted that “when a State empowers a group of active market participants to decide who can participate in its market, and on what terms, the need for supervision is manifest.” Furthermore, while the Board did not argue that it was actively supervised by the state, the Court concluded its decision by reiterating the requirements of active state supervision: (1) the substance of the anti-competitive decision must be reviewed by a state supervisor; (2) the state supervisor must have the power to veto or modify decisions to ensure that they align with state policy; (3) the “mere potential for state supervision” is not a sufficient substitute for an actual decision by the state; and (4) the state supervisor may not be an active market participant.

The 2013 Phoebe Putney decision focused on the “clear articulation” prong of Midcal. That case arose out of a merger of a for-profit hospital with a hospital owned and operated by a county hospital authority (Authority), which was created by the state legislature but operated independently of the state government. The FTC alleged that the transaction was technically structured as an acquisition of the for-profit by the Authority, in a specific attempt to take advantage of the state action exemption. The 11th Circuit observed that Georgia’s Hospital Authorities Law granted hospital authorities the power to “operate projects” including hospitals, to “make and execute contracts and other instruments necessary to exercise the[ir] powers,” and to “acquire by purchase, lease or otherwise … projects.” Based on this broad language, the 11th Circuit found that the legislation clearly indicated that the Georgia Legislature anticipated that the powers it granted to the Authority would produce anti-competitive effects, and thus were a foreseeable result of the legislation and sufficient to meet the Midcal “clear articulation” test. The Supreme Court reversed, holding that the Georgia Legislature did not clearly articulate or affirmatively express a state policy to displace competition in the market for hospital services. The Court noted that the Authority needed to show not just that it had been delegated authority to act, but also that it was authorized to act or regulate in an anti-competitive manner.

The combined effect of NC Dental and Phoebe Putney is that any regulatory body that is not clearly part of the executive branch of a state will have a significantly higher burden to take advantage of the state action exemption. This will require state governments to review and reconsider the structure and procedures of such bodies and should force the bodies themselves to carefully consider whether the state action exemption applies before taking any action that might implicate the federal antitrust laws.

It will also mean that industry participants regulated by such quasi-governmental bodies likely will be emboldened to challenge more adverse actions in court. Given the prevalence of quasi-government entities in states – many of which include market participants – and that they regulate a wide variety of industries including energy, professional services, health care, transportation, and many others, these decisions will likely have significant policy and legal implications for years to come.

# 2AC

## T

### Core Antitrust Laws – 2AC

#### We meet – expands reach of Sherman and FTCA

Crane 16 [Daniel A. Crane Frederick Paul Furth Sr. Professor of Law, University of Michigan Law School Adam Hester J.D., May 2016, University of Michigan Law School, 2016, State-Action Immunity and Section 5 of the FTC Act, 115 MICH. L. REV. 365, https://repository.law.umich.edu/cgi/viewcontent.cgi?article=1510&context=mlr]

This Article addresses the statutory prong—federal antitrust preemption of state law—in the wider context of constitutional and institutional history. In particular, it examines the assumed, but never decided, position that the United States Federal Trade Commission (“FTC”) lacks any preemptive power over anticompetitive state and local regulations, apart from the relatively light preemptive reach of the Sherman Act. It asserts, to the contrary, that the best historically informed and institutionally sound reading of Section 5 of the Federal Trade Commission Act suggests that the FTC should enjoy what the Supreme Court has hypothesized as “superior preemption authority” over state and local regulations that unduly restrict competition.12

As a matter of legal doctrine, the question of the FTC’s preemptive authority originates in the Supreme Court’s seminal 1943 decision in Parker v. Brown. 13 In Parker, the Court held that “[t]here is no suggestion of a purpose to restrain state action in the [Sherman] Act’s legislative history.”14 The resulting state-action immunity doctrine sharply limited any preemptive scope of the Sherman Act over anticompetitive state regulations.15 Parker also rejected a dormant commerce clause challenge to the state regulation at issue.16 The case thus showcased the Court’s uniform reluctance to permit any strand of federal law—constitutional or statutory—to revive Lochnerism.

## Section 5

### Section 5 CP – 2AC

#### CP’s rolled back – Courts and Congress

Jones and Kovacic 20 (Alison Jones, Professor of Law, King’s College London; and William E. Kovacic, King’s College London, George Washington University, United Kingdom Competition and Markets Authority; “Antitrust’s Implementation Blind Side: Challenges to Major Expansion of U.S. Competition Policy,” The Antitrust Bulletin, 65(2), 3-20-2020, DOI: 10.1177/0003603X20912884)

B. Infirmities of Section 5 of the Federal Trade Commission Act

One possible solution to rigidities that have developed in Sherman Act jurisprudence is for the FTC to rely more heavily on the prosecution, through its own administrative process, of cases based on Section 5 of the FTC Act and its prohibition of “unfair methods of competition.”93 This section allows the FTC94 to tackle not only anticompetitive practices prohibited by the other antitrust statutes but also conduct constituting incipient violations of those statutes or behavior that exceeds their reach. The latter is possible where the conduct does not infringe the letter of the antitrust laws but contradicts their basic spirit or public policy.95

There is no doubt therefore that Section 5 was designed as an expansion joint in the U.S. antitrust system. It seems unlikely to us, nonetheless, that a majority of FTC’s current members will be minded to use it in this way. Further, even if they were to be, the reality is that such an application may encounter difficulties. Since its creation in 1914, the FTC has never prevailed before the Supreme Court in any case challenging dominant firm misconduct, whether premised on Section 2 of the Sherman Act or purely on Section 5 of the FTC Act.96 The last FTC success in federal court in a case predicated solely on Section 5 occurred in the late 1960s.97

The FTC’s record of limited success with Section 5 has not been for want of trying. In the 1970s, the FTC undertook an ambitious program to make the enforcement of claims predicated on the distinctive reach of Section 5, a foundation to develop “competition policy in its broadest sense.”98 The agency’s Section 5 agenda yielded some successes,99 but also a large number of litigation failures involving cases to address subtle forms of coordination in oligopolies, to impose new obligations on dominant firms, and to dissolve shared monopolies.100 The agency’s program elicited powerful legislative backlash from a Congress that once supported FTC’s trailblazing initiatives but turned against it as the Commission’s efforts to obtain dramatic structural remedies unfolded.101

## Adv cp

### A2: international AI

#### Federal nanotech regulation fails – state experimentation solves knowledge gaps and flexibility

Strifling 10(David, Freedman Fellow, Temple University Beasley School of Law, “ENVIRONMENTAL FEDERALISM AND EFFECTIVE REGULATION OF NANOTECHNOLOGY,” http://www.msulawreview.org/wp-content/uploads/2012/10/2010-4\_Strifling.pdf)

As noted in Part I, the presence of interstate externalities, whether physical, economic, intertemporal, or psychological, is considered by many scholars on both sides of the federalism debate to be the best justification for centralized regulation.240 That recognition is why the consideration of externalities is the first part of the contextual analysis proposed in Part I. As this Part will discuss, the question of whether nanotechnology production, emissions, and use will generate significant externalities is the first of many knowledge gaps that are likely to plague regulators attempting to regulate nanotechnology and other emerging technologies. The question of physical externalities is perhaps easiest to begin assessing. Many nanoparticles are incorporated into products and seem more likely to be found in solid waste as opposed to air emissions.241 For example, nanoparticle-silver is often incorporated in ordinary consumer products like socks because it has antibacterial and odor-fighting properties. But, the nanosilver can leach into wash water during ordinary laundering, and will ultimately join the solid waste stream when the socks are thrown away. Solid wastes are typically handled locally and therefore have a more limited transport range than pollutants released in air emissions.242 This makes it less likely, although not impossible, that significant interstate externalities will result, and may weigh in favor of decentralization. However, such conclusions should be drawn only with caution because studies have shown that at the nanoscale, even small changes in production methods may lead to different toxicological properties and perhaps increased mobility.243 Geographically, it is difficult to quantify how much of a particular nanoparticle is produced in a given state, region, or country.244 This makes application of the “[m]atching [p]rinciple” difficult.245 It may be that certain emerging technologies will be produced within a single state, or that they will be national in scale. At this point, it appears that nanotechnology production will not be limited to a single state or region, but it is not clear how dispersed the activity will be. It is possible that as with other emerging technologies, nanotechnology development may occur within localized or regional hot spots of activity. At this stage, it is more difficult to assess the possibility of economic, intertemporal, or psychological externalities. The presence or absence of economic and psychological externalities will become apparent as the technology proliferates. Intertemporal externalities are perhaps the toughest to assess immediately. Because nanoparticles have characteristics that differ from macro-scale equivalents (for example, nanosilver has different physical properties than macro-scale silver), it cannot be proven that they will not also have different long-term consequences.246 At least at the outset, it seems likely that state regulators will be better equipped than federal regulators to form an opinion as to whether nanotechnology generates significant externalities. Most obviously, they will be aware of whether their individual states are on the receiving end of “nanopollution” from other states. State and local regulators can, of course, report their experiences of this kind to their federal counterparts for compilation and comparison with similar information from other states. This process will provide a solid base of knowledge with which to assess the next generation of regulations. B. Knowledge Gap Two: What Are the Costs and Benefits of Nanotechnology Regulation? The second part of the contextual analysis described in Part I recommends examining the economies of scale associated with federal or state regulation. Professor Esty remarked that it will most likely be inefficient for every “hamlet” to perform detailed and highly technical analyses of nanotechnology.247 That is intuitive, although the costs and benefits involved with either centralized or decentralized regulation of nanotechnology are difficult to measure. In particular, the difficulty in estimating the benefits of nanotechnology will make economically efficient regulation (i.e., maximizing the difference between benefits and costs) impossible, but finding the most cost-effective policy (i.e., minimizing the costs) may eventually become an achievable goal. The governance scheme should also provide incentives for new research and development efforts to better control future nanoparticle emissions. This likely counsels against the use of a federal command and control scheme rooted in the uniform imposition of a particular control technology across state jurisdictions.248 Such standards tend to “freeze” the development of technology because a company that develops one may be “‘rewarded’ by being held to a higher standard of performance and thereby not benefit financially from its investment.”249 Here, too, the diverse experiments and experiences of various state regulators will help to illustrate the differences between various policy choices. It may be that a particular state’s regulatory approach maximizes the economic benefits of nanotechnology while another state is devoted to maintaining environmental quality. The balance between the two can best be struck if the consequences of these differing approaches are known. C. Knowledge Gap Three: Do Regulators Have the Tools to Successfully Monitor and Enforce Compliance with Standards? The third part of the contextual analysis described in Part I recommends analyzing whether regulatory failures are likely to occur. As discussed in more detail later in this Paper, one of the difficulties with using existing statutory authority to regulate nanotechnology is that it is uncertain whether those authorities adequately cover particles at the nanoscale.250 Similarly, some existing authorities contain minimum thresholds (typically weights) below which entities are accepted from regulations. Those limits may not be low enough to cover comparatively large cumulative quantities of nanoparticles. A related question is whether regulators have the technological tools to successfully monitor compliance with the standards that are ultimately enacted. Many environmental statutes are set up such that the governing standards are set at the federal level, and enforcement is handled locally.251 But, such standards cannot be effectively implemented if they cannot be enforced. To give one example, state regulators cannot discern the quantity of nanoparticles emitted due to their miniscule size. State experimentation with varying enforcement methods can provide useful information both to the federal government and to other states in at least three ways. First, states can supplement limited federal enforcement resources. As in the context of water and air regulation, it is extremely unlikely that the federal government has the resources to successfully police all regulated firms. Placing some enforcement control in the hands of the states multiplies the resources available for this task. Second, and more relevant to the point of filling knowledge gaps, the success or failure of di- verse state experiences can help tailor future enforcement efforts both in other states and at the federal level. For example, if one state chooses a method of compliance verification (e.g., self-monitoring and reporting) and that method proves effective and less resource-intensive, other jurisdictions may choose to adopt it to preserve their own resources. Finally, a cooperative state and federal scheme would offer more adaptability, which as discussed above is critically important to successful governance of emerging technologies.252 D. Knowledge Gap Four: How Will the Public React to Widespread Deployment of Nanotechnology? The fourth facet of the contextual analysis considers democratic ideals and public involvement. As previously discussed, Professor Revesz has suggested that public choice theory (suggesting that concentrated industry pressure will dominate diffuse pro-environment interests) is overtaking—or has already overtaken—externalities as the top justification for federal environmental regulation.253 It is not surprising, then, that several scholars have suggested that stakeholder involvement, and especially public involvement, is an important facet of an equitable governance scheme.254 This is true even though the public may not have the technical expertise to evaluate these questions.255 At first glance, it would seem that such involvement is more likely under a decentralized regulatory scheme. However, there are conflicting reports about what the public actually wants. One line of thinking is that even though most of the public has no technical expertise, they prefer not to give up control over emerging technology policy.256 For example, one survey reported that only about one-fourth of Americans believe that “decisions about the issue of genetically modified food are so complicated that it is a waste of time to consult the public on this subject.”257 But in another survey nearly three-fourths said they would prefer that the views of experts guide scientific policy.258 Yet, another survey reported that three-fourths of the public preferred that technology decisions be made on the basis of science rather than morals.259 The upshot of these studies is that about half of the public is happy with the status quo of experts making decisions based on science.260 The other half would prefer that decisions about technology “be influenced by some combination of moral and ethical principles shared by average citizens.”261 Perhaps the bottom line is that scientific experts are better qualified to judge science, but average people are better qualified to judge ethics and morality.262 State and local governments are likely better equipped to handle public information campaigns as opposed to the federal government. For example, the city of Cambridge, Massachusetts has created the Cambridge Nanomaterials Advisory Committee, which the City Manager charged with developing recommendations for oversight of local nanotechnology activities.263 One of the Committee’s recommendations was that the city “[o]ffer up-to-date health information to residents on products containing nanomaterials and sponsor public outreach events.”264 The Committee recommended two specific strategies to accomplish this goal. The first is to post on the City’s website basic information about nanotechnology and, to the extent possible, about the types of nanomaterials being used in Cambridge.265 The second is to sponsor public forums to discuss nanotechnology with Cambridge residents, including gathering information about the residents’ preferred methods to receive information about nanotechnology.266 Both of the Cambridge strategies would be impossible to successfully implement at the federal level simply because of the scale of the undertaking. The best that federal regulators can likely do in this direction is to post general information about nanotechnology on the internet, as the EPA has done.267 This illustrates the advantage of state and local involvement in public outreach efforts. And if national use of this information becomes desirable, state and local agencies can simply compile the information they have gained into an aggregated database or survey instrument. E. Knowledge Gap Five: What Substantive Standards Should Govern Nanoparticle Emissions? The final and perhaps the most daunting knowledge gap consists of the types of substantive controls and standards that are necessary to successfully regulate nanotechnology to appropriately protect public health and the environment while authorizing safe technological development.268 The case for state and local involvement here is less clear than those related to the other knowledge gaps because it seems likely that the initial scientific and technical standards that will govern nanotechnology will likely be developed at the federal level.269 And yet, state and local regulators can provide valuable data that their federal counterparts can use in ongoing standards development. For example, the first recommendation of the Cambridge Nanomaterials Advisory Committee was that the City should “develop an inventory of commercial, industrial, and research facilities in Cambridge that manufacture, process, handle, or store engineered nanoscale materials (excluding nanomaterial-containing consumer products).”270 The Committee noted that “[l]essons learned from the information gathered through this survey will be incorporated into further efforts to provide technical assistance to encourage best practices for health and safety.”271 It also noted that to the extent firms have concerns about sharing such information, they could be protected as confidential business information under state public records laws.272 To the extent that confidentiality is a concern, state and local governments could simply aggregate the information collected without identifying specific responders, as the totals (rather than individual responses) would likely be more useful to federal regulators working on standards development. Some commentators have called for entirely new regulatory regimes to govern nanotechnology.273 There is no question that creating a new environmental law out of whole cloth, or totally overhauling existing regimes, is very expensive. In this fractured political climate, it may also be politically impossible. Congress has not passed significant environmental legislation since the Clean Air Act Amendments of 1990.274 In 2009, Congress expected to, but failed to, pass comprehensive energy legislation despite Democratic majorities in both houses as well as a Democratic president.275 As such, it appears unlikely that Congress will enact a new statutory scheme to govern nanotechnology. However, both the EPA and a series of American Bar Association (ABA) analyses have suggested that in practice, existing statutory schemes provide the necessary authority to regulate nanotechnology.276 But, this strategy has its shortcomings, as demonstrated in the following convoluted hodgepodge of statutory authority described in the EPA’s 2008 Draft Nanomaterial Research Strategy: Regulatory decisions regarding nanomaterials are covered under current statutes. EPA intends to review nanomaterial products and processes, pursuant to its authorities under the Toxic Substances Control Act (TSCA), the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the Clean Air and Water Acts (CAA and CWA), the Safe Drinking Water Act (SDWA)[,] Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA). Under the Toxic Substances Control Act . . . [t]here is some question as to whether nanomaterials are “new” compounds. Under FIFRA nanomaterials added to an existing pesticide product may require reapproval, and the EPA must determine whether the altered product might cause unreasonable adverse effects on the environment including human health risks. The CAA allows for the development of air quality criteria for pollutants anticipated to endanger public health and welfare, mandates the identification of the sources and the issuance of technology-based emissions standard for 189 pollutants, and requires that any mobile source fuel or additive be registered. Risks from airborne nanomaterials may reasonably need assessing in all of these areas. Wastewater streams containing nanomaterials might be controlled through effluent limits in permits established under the CWA. If nanomaterials enter drinking water they may be subject to regulation using Maximum Contaminant Level Goals and Maximum Contaminant Levels under SDWA. Risks from nanomaterials in waste sites would be evaluated and controlled under the authority of CERCLA and RCRA.277 However, other assessments of these existing schemes have concluded that existing federal regulatory schemes are inadequate to assess and respond to the prospective risks posed by nanotechnology.278 Significant regulatory coverage gaps (and in some cases, gulfs) would manifest upon any effort to use existing federal regulatory authority, and only that authority, to regulate nanotechnology.279 These gaps can take multiple forms. For example, some existing environmental statutes (such as the Toxic Substances Control Act (TSCA) and the Resource Conservation and Recovery Act (RCRA)) are triggered based on volume or mass.280 Such measures are inappropriate for nanotechnology regulation.281 Alternatively, the fundamental incapacity to detect and measure nanoscale quantities will make regulation difficult.282 In practice, the experience of state and local regulators can ultimately help the EPA decide which regulatory authority works best. The discussion of potentially applicable federal statutes should make clear that even if nanotechnology is regulated at a centralized level, coordination difficulties will likely arise because nanotechnology arguably falls within the purview of a variety of different statutes and different agencies.283 Therefore, centralized regulation cannot be justified on the basis of improved coordination. Similarly, numerous emerging technology scholars have stressed the need for an adaptable scheme that can identify and fill regulatory gaps as time passes and new discoveries and applications for the technology arise.284 A unitary scheme across all jurisdictions would likely come with decreased flexibility, and some have argued that such an outcome is preferable because flexible regulation leads to power imbalances between concentrated corporate interests and diffuse public interests.285 On the other hand, use of the states as “laboratories” would allow increased experimentation and, perhaps, increased responsiveness to developments in the technology. As noted above, the scientific and technical knowledge gaps will make it difficult to utilize solely centralized federal regulation to govern emerging technologies.286 This is especially true as to the lack of capacity to monitor and control emissions, traditionally a state function.287 On the other hand, widespread involvement of states and local governments could generate significant amounts of data and help to fill these knowledge gaps. The next and final Part elaborates on this conclusion and reviews an example of the roles that state and local governments might play in information generation to fill knowledge gaps and to simplify ultimate decisions about nanotechnology regulation through the contextual analysis or otherwise. IV. CONCLUSION The foregoing discussion illustrates the daunting knowledge gaps that will hamper attempts to regulate nanotechnology. And yet, it is necessary to formulate governance strategies now that preserve options and flexibility while averting the necessity to act later under emergency conditions. The solution to this quandary is to build our knowledge base as quickly as possible while retaining the flexibility to adapt the regulatory scheme as time goes on. In practice, such a system might develop as outlined in the following two steps. Initial scientific and technical analyses, including standard development, should take place at the federal level to preserve economies of scale. The EPA has already begun this process.288 Simultaneously, states and local governments can begin information collection efforts that inform the federal standards development process. Once the standards are issued, application and enforcement of those standards could be handled at the decentralized state or regional level in order to give due consideration to democratic ideals and public involvement. This approach will lead to diversification and expansion of our nanotechnology knowledge base because it would engender widespread familiarity with nanotechnology regulation at the state level. As more and more states fulfill roles as one of Justice Brandeis’s “laboratories,” the whole regulatory community will learn more about new approaches to nanotechnology regulation that can play a part in filling all of the knowledge gaps previously identified.289 Several arguments to the contrary are not convincing. First, some have claimed that inconsistent regulatory efforts in different jurisdictions could have a “chilling effect” on nanotechnology development, as would have been the case if “third car” standards had been allowed under the Clean Air Act.290 But it is not at all clear, or even likely, that individual jurisdictions would apply individual standards to nanotechnology design, as opposed to production, distribution, use, and disposal. Second, agency capture and race to the bottom are unlikely to occur. By definition, emerging technologies are new, and thus capture seems less likely because of the absence of the factors that are typically thought to cause it: a well-established industry lobby; agency officials with previous experience in industry, and vice versa; and little or no local political pressure.291 A race to the bottom seems unlikely for similar reasons. As noted above, the geographic distribution of nanotechnology production and use remains unclear. It is possible that some areas may have little to no nanotechnology development, making a race to the bottom less likely because nanotech industries will prefer to locate plants in states and regions with an existing nanotechnology base. Therefore, arguments against decentralization do not overcome the substantial benefits that will arise from using the information generated by state and local governments to fill knowledge gaps. And yet, the valuable information obtained during early regulatory efforts will only be useful if the regulatory system initially put in place has the flexibility to assimilate and respond to the new information. Initial regulatory schemes must therefore provide the opportunity to revisit both substantive and administrative provisions as time goes by.

## Floodgates

### Floodgates DA – 2AC

#### No link – Section 5 isn’t privately enforceable

Crane 16 [Daniel A. Crane Frederick Paul Furth Sr. Professor of Law, University of Michigan Law School Adam Hester J.D., May 2016, University of Michigan Law School, 2016, State-Action Immunity and Section 5 of the FTC Act, 115 MICH. L. REV. 365, https://repository.law.umich.edu/cgi/viewcontent.cgi?article=1510&context=mlr]

B. Institutional Constraints and Capacities

Beyond the core concerns about the anti-democratic and pro-laissez faire tendencies of economic substantive due process, there lurk questions about institutional constraints and capacities. Allowing the Sherman Act to become an aggressive anti-regulatory charter would pose considerable risks of unwieldy and excessive challenges to state regulatory regimes and state sovereignty, since the Sherman Act is privately enforceable.251 Further, the federal courts may lack the expertise and fact-finding processes to make well-informed decisions over whether state regulatory decisions reflect exercises of police power in the public interest, or, rather, naked pork-barreling for the benefit of concentrated economic interests. On these scores, FTC enforcement under Section 5 of the FTC Act enjoys a considerable advantage over the Sherman Act.

First, Section 5 of the FTC Act is enforceable only by the FTC, not by private plaintiffs.252 Superior preemption under Section 5 would not lead to a flood of private challenges against state regulations, nor would it injure state interests by forcing the states to constantly defend anti-regulatory actions by private interests. (Recall that Parker itself involved a private challenge to state law, as have many of the important state-action immunity cases since).253 Rather, preemption of state law would depend on an administrative decision by a majority of the FTC commissioners to bring an action or otherwise declare a state law preempted. Preemption would not flow directly from the statute, but from a decision of the FTC to enforce the statute in a particular context. The burden of the intrusion on federalism interests and state sovereignty would therefore be considerably lower than if the Sherman Act were read to directly preempt anticompetitive state laws, permitting private plaintiffs to seek invalidation of state laws whenever the laws infringed on competition.

#### And – their ev says floodgates is about Section 4 of Clayton

Their card for reference. MSU = Blue.

Stern 3—(BA, JD Candidate at University of Pennsylvania Law School). Toby J. Stern. 2003. “Federal Judges and Fearing the "Floodgates Of Litigation". 6 U. Pa. J. Const. L. 377. <https://scholarship.law.upenn.edu/jcl/vol6/iss2/8/>. Accessed 11/4/21.

\*\*Clayton Act Section 4 is the basis for private rights of action in antitrust—it establishes damages for "any person injured in his business or property by reason of anything forbidden in the antitrust laws”

Another set of cases in which the floodgates argument recurs are those involving the enforcement of the antitrust laws under Section 4 of the Clayton Act.3 9 Floodgates arguments are particularly applicable to Section 4 cases. That statute mandates treble damages and attorneys' fees to a successful antitrust litigant,40 providing an incentive for 41 someone with a marginal claim to sue.

For example, in Calderone Enterprises Corp. v. United Artists Theatre Circuit, Inc., the Second Circuit Court of Appeals considered "the question whether one who is not a 'target' of an alleged antitrust conspiracy has standing under § 4 of the Clayton Act., 42 In answering the question in the negative, the court argued against opening the floodgates to "every creditor, stockholder, employee, subcontractor, or supplier of goods and services that might be affected."4 Specifically, the court claimed that "the lure of a treble recovery, implemented by the availability of the class suit... would result in an overkill." 44 The dissenting judge, however, held fast to his view of the relevant Supreme Court precedents, claiming that the Court "has constantly recognized that antitrust laws should be given the broadest and most liberal interpretation in order to effectuate Congressional intent."45

A similar situation arose in In re Industrial Gas Antitrust Litigation.4 In that case, the Seventh Circuit held that a fired and blacklisted gas worker was not entitled to bring a private treble damages suit against his employer under Section 4.47 The court echoed the fear expressed in Calderone (and cited the language quoted from Calderone above), claiming that "[u]nless § 4's phrase 'by reason of' is interpreted to require a direct causal link between the antitrust violation and the resulting injury, the courts would be flooded with antitrust litigation.”48

Thus the floodgates argument can appear in many types of cases, but tends to recur in those cases where a litigant seeks to establish a new right or cause of action. 49 At the appellate level, it is as likely to be found in dissenting opinions as it is in those of the majority.

#### NC Dental thumps – only a risk the aff solves

Hittinger 19 [Carl W Hittinger, BakerHostetler’s antitrust and competition practice national team leader, J.D., Temple University Beasley School of Law, September 2019 https://www.bakerlaw.com/webfiles/Litigation/2019/Alerts/GCR-Private-Antitrust-Litigation.pdf]

As for private litigation, multiple cases following North Carolina Dental have identified open issues and emerging trends for antitrust actions involving government bodies. One important threshold issue confronted by private litigants is whether claims may be dismissed at the very onset of litigation due to application of state action immunity. Some courts have denied motions to dismiss claims pursuant to Federal Rule of Civil Procedure 12(b)(6), as long as the complaints plausibly allege the immunity is not established. In a case similar to North Carolina Dental, for example, a district court recently ruled it would be ‘premature’ to dismiss an antitrust claim against the Board of Dental Examiners of Alabama where the complaint plausibly alleged that the board was not actively supervised by the state.34 Other courts have implicitly rejected the notion that parties can plead away application of the immunity. In one such recent case, a district court dismissed an antitrust claim against a public utilities body based on South Carolina’s statutes reflecting a clearly articulated policy of displacing competition in and active supervision of the sale of electricity, notwithstanding complaint allegations that the body had exceeded its authority and was inadequately supervised by the state.35

Courts have also diverged on whether rulings on the dismissal of claims under state action immunity are immediately appealable. After North Carolina Dental, the Ninth Circuit held that a lower court order denying a dismissal motion based on state action immunity is not immediately appealable.36 The Ninth Circuit accepted that the Fifth and Eleventh Circuits ‘have reached the opposite conclusion’, but explained that disallowing immediate appeals of the rejection of the immunity defence is ‘the better view’ given, among other reasons, the Supreme Court’s caution against broad assertions of immunity against suits.37 Similarly, the DOJ has submitted an amicus brief arguing that refusing to dismiss under state action immunity is not immediately appealable.38

The most challenging issue since North Carolina Dental may continue to be whether the particular facts of individual cases can satisfy the application of state action immunity to government bodies with private actors. The Supreme Court implicitly acknowledged there would be uncertainty when recognising that application of the doctrine requires a ‘flexible and contextspecific’ analysis. Justice Samuel Alito’s dissent put a finer point on the uncertainty, identifying the lack of clarity on what constitutes ‘active market participants’ or how to define the markets in which they participate.39 One FTC commissioner agreed that these are ‘key questions that need to be addressed’.40 And they have been, somewhat, in recent years.

As Justice Alito forecasted, litigants and courts have laboured with determining whether government entities include sufficient private participants to require such entities to prove satisfaction of both the ‘clearly articulated state policy’ and ‘active state supervision’ state action immunity prongs (as opposed to only the first).41 A developing approach to this issue among courts focuses on whether the private participants actually exercised control over the governmental entities in question. For instance, following North Carolina Dental, the Third Circuit reasoned that a state university does not need to satisfy the active state supervision prong because the private party with which the university allegedly conspired in real estate dealings had not dominated the university’s real estate decisions.42 More recently, a district court determined that a state agency tasked with overseeing certain healthcare programmes, with a board consisting of five healthcare providers and six members who were not healthcare providers, was excused from satisfying the active state supervision prong because the board was not ‘controlled’ by the private participants who comprised ‘only a minority’ of the agency board.43

A related issue that has proven to be equally challenging is whether the state itself must provide the required active supervision. To illustrate, the Ninth Circuit recently held that ‘active supervision must be “by the State itself ”’ and, consequently, the court ruled that Seattle’s ordinance regulating ride-hailing services (eg, Uber) was not eligible for state action immunity because the city of Seattle, rather than the state of Washington, supervised and enforced the ordinance.44 At the same time, other courts have found active supervision satisfied where provided by municipalities alone.45 As these and similar cases progress through the courts, further clarity on areas of uncertainty about state action immunity should be realised.

Conclusion

The Supreme Court’s decision in North Carolina Dental not only provides valuable guidance for the application of state action immunity, it also sets the stage for continued development of the doctrine. In the nearly five years since the decision, government antitrust enforcers have relied on it for broadening their enforcement of the federal antitrust laws against quasi-government actors. Private litigants have also relied on it in pursuing cases that portend widespread impact on state and local government operations. All who believe they operate with state action immunity should proceed with caution and consider reviewing their conformity with the principles explained by the Supreme Court, in addition to assessing whether they remain eligible for immunity

#### No spillover – they’ll use MDL to handle higher caseloads

Wendy Behan 13, is a partner with San Diego-based CaseyGerry and a member of its pharmaceutical and medical device litigation practice team, 11/4/13, “Multidistrict Litigation Helps Relieve Clogged Courts,” http://www.caseygerry.com/bylined-articles/multidistrict-litigation-helps-relieve-clogged-courts

Large-scale litigation makes especially huge demands on an already over-burdened system. Designed to streamline the process, multidistrict litigation (MDL) refers to a special federal legal procedure created to consolidate a range of cases — such as pharmaceutical and other product liability suits, patent infringement and investment fraud cases.¶ In fact, for cases involving common questions of fact, multidistrict litigation has grown to become the preferred method by parties and the courts as it is an effective tool to centralize a large number of individual cases.¶ Statistics from the U.S. Judicial Panel on Multidistrict Litigation indicate a sharp rise in MDLs. From 1968 through 2012, there were 415,995 civil actions centralized for pretrial proceedings in MDLs, up from 393,676 in 2011 and 349,913 in 2010.¶ MDLs can be confusing — even for seasoned attorneys. Although it’s possible for multidistrict cases to include class actions, MDL is not a type of class action (a civil proceeding usually brought about on the behalf of multiple clients with common or similar injuries caused by the same product or action). Unlike class actions, in an MDL there is not a single trial that resolves all the cases; rather, the individual cases are consolidated under a single federal judge.¶ For cases to be considered for MDL, the judicial panel must find one or more common questions of fact. Since commonality is also a required element for a class action, class actions are often included in MDLs.¶ Created by an act of Congress (28 U.S.C. Section 1407) in 1968, the U.S. Judicial Panel on Multidistrict Litigation is comprised of seven federal judges, each from a different judicial circuit. The panel was originally developed in response to problems in courts related to a nationwide antitrust conspiracy among electrical equipment manufacturers. Lawmakers and the judiciary agreed that the panel could coordinate such complex cases — which are frequently filed in multiple federal court districts.¶ With this in mind, the panel was developed to determine whether individual cases involving similar issues should be moved from various courts to a single federal district court for pretrial proceedings. Typically, cases are consolidated under one federal judge who handles common pretrial discovery matters. The goal of this process is to conserve resources — avoiding duplication of discovery and preventing inconsistent pretrial rulings.¶ Some states, including California with its Judicial Council Coordinated Proceeding, have a similar mechanism known as multicounty litigation. A similar body or the state high court makes the decision to transfer at the state court level. As with MDL, a single judge oversees and administers the cases so that they can be resolved efficiently.¶ Since its inception, the judicial panel has considered motions for centralization in hundreds of thousands of cases — ranging from airplane crashes and train wrecks to drugs and other products liability cases; patent validity and infringement; antitrust price fixing; securities fraud and employment practices.

## OS

### DOJ – 2AC

#### Current cases thump.

Tara Lachapelle 21, staff writer at Bloomberg, “Wall Street Is Ready to Put Lina Khan’s FTC to the Test,” Bloomberg, 8-25-2021, https://www.bloomberg.com/opinion/articles/2021-08-25/wall-street-is-ready-to-put-lina-khan-s-ftc-to-the-test

Already, regulators have two major cases sucking up resources. The FTC last week refiled its monopoly lawsuit against Facebook Inc., alleging its takeovers of Instagram and WhatsApp violated antitrust laws. (Its deal last year for Giphy also employed a sneaky maneuver to avoid showing up on regulators’ radars, and now they’re looking to close that loophole.) The Justice Department is pursuing its own case against Google. And what was initially seen as a narrow effort to reel in dominant technology companies has since expanded to other industries in light of a sweeping executive order from President Biden. Even more obscure areas such as ocean shipping are facing new scrutiny.

M&A reviews had already become more of a slog in recent years. Dechert LLP’s Antitrust Merger Investigation Timing Tracker — aptly nicknamed the DAMITT report — shows how investigations that once took an average of eight months now stretch into a year or longer:

#### Funding is normal means – AND boosts are coming

Byers 21 (Dylan Byers, senior media reporter for NBC News; **internally citing George Washington University professor and former FTC chair William Kovacic**; “Is Facebook untouchable? It's complicated,” NBC News, 7-1-2021, https://www.nbcnews.com/tech/tech-news/facebook-untouchable-complicated-rcna1323)

The House Judiciary Committee recently advanced six bills that would bolster the government's ability to regulate Big Tech. They range from simple budgeting measures — one would give more funding to the FTC and the Department of Justice for their antitrust enforcement efforts — to profound reforms — one that would stop platform companies from preferencing their products over those of their competitors and another that would make it illegal for companies to eliminate competitors through acquisitions.

This legislative package faces an arduous road ahead. House Majority Leader Steny Hoyer, who sets the House floor schedule, has said none of the six bills are ready for a vote, which suggests they don't have broad bipartisan support. If and when they do make it through the House, they face an even harder battle in the Senate.

"It's hard to imagine that the larger legislative package is accomplished this year," Kovacic said, though he predicted a few of the less-threatening bills — budgeting, for example — are likely to pass on their own.

"The funding for the FTC and DOJ antitrust divisions, it's nearly 100 percent likely that Congress will pass that law," he said. He said another bill, which would block the tech firms from moving court hearings to more favorable states, was also likely to pass.

#### Other entities can enforce.

Jones 20 [Alison Jones & William E. Kovacic, Jones is a professor at King’s College London; Kovacic is Global Competition Professor of Law and Policy, The George Washington University Law School, “Antitrust’s Implementation Blind Side: Challenges to Major Expansion of U.S. Competition Policy,” The Antitrust Bulletin, vol. 65, no. 2, SAGE Publications Inc, 06/01/2020, pp. 227–255]

C. Improving Capability: Agency Cooperation and Project Selection

The U.S. antitrust system is famous for its decentralization of the power to prosecute, giving many entities – public agencies (at both the federal and state levels), consumers, and businesses – competence to enforce the federal antitrust laws. The federal enforcement regime also coexists with state antitrust laws and with sectoral regulation, at the national and state levels, that include competition policy mandates.

The extraordinary decentralization and multiplicity of enforcement mechanisms supply valuable possibilities for experimentation and provide safeguards in case any single enforcement agent is ~~disabled~~ [hamstrung](e.g., due to capture, resource austerity, or corruption).75 Among public agencies, there is also the possibility that federal and state government institutions, while preserving the benefits of experimentation and redundancy, could improve performance through cooperation that allows them to perform tasks collectively that each could accomplish with great difficulty, or not at all, if they act in isolation. In the discussion below, we suggest approaches that preserve the multiplicity of actors in the existing U.S. regime but also promise to improve the performance of the entire system through better inter-agency cooperation – to integrate operations more fully “by contract” rather than a formal consolidation of functions in a smaller number of institutions.

#### States fill-in

Wisking et al 20 (Stephen Wisking, Kyriakos Fountoukakos and Marcel Nuys, Herbert Smith Freehills LLP, “Digital Competition 2021,” Law Business Research Ltd., October 2020, https://docplayer.net/201129322-Digital-competition-2021.html)

There is a clear trend towards increased antitrust scrutiny of digital markets by federal and state antitrust enforcers and the US Congress. In July 2019, the DOJ announced it was reviewing the practices of market-leading online platforms and in October 2020 filed suit against Google. The FTC formed a Technology Enforcement Division in 2019 that is actively conducting investigations and the agency is reportedly on the verge of bringing a suit against Facebook. State Attorneys General of all or nearly all 50 states have had active investigations of Google and of Facebook, and investigations of other technology firms have recently been initiated. Eleven states joined the DOJ in its suit against Google, while other states indicated that they may pursue other claims against Google, and still others are reportedly considering a suit with or without the FTC against Facebook. In Congress, both the House Judiciary Subcommittee on Antitrust, Commercial and Administrative Law and the Senate Judiciary Subcommittee on Antitrust, Competition Policy and Consumer Rights have held antitrust hearings on digital markets. And in October 2020, the majority staff of the House Judiciary Subcommittee on Antitrust, Commercial and Administrative Law issued a digital markets report recommending numerous proposals to restore competition in digital markets and to strengthen antitrust law and enforcement generally. Legislators have proposed legislation aimed at strengthening antitrust enforcement. Developments among litigated cases before courts are mixed. In 2020, the DOJ lost its effort to block Sabre’s acquisition of an allegedly nascent competitor, Farelogix, but the DOJ later had the decision vacated on appeal after the parties abandoned their transaction. In 2019, the Supreme Court ruled against Apple, finding that iPhone owners had standing to sue Apple for federal antitrust violations regarding the App Store. Individual companies are increasingly filing private litigation against some of the largest technology firms as well.

### Randomhouse – 2AC

#### **Past cases prove no spillover OR doj fails**

*\* tons of past doj monopsony cases disprove the disad*

*\*nyu law and mit economics profs cited in the yale law journal > randos*

Hemphill 18 (C. Scott Hemphill is Professor of Law at New York University School of Law; Nancy L. Rose is the Charles P. Kindleberger Professor of Applied Economics at the Massachusetts Institute of Technology. Hemphill is an economic expert witness in an antitrust case alleging harm to sellers. yale law journal, 127:2078, 2018, “mergers that harm sellers” <https://www.yalelawjournal.org/pdf/HemphillRose_m2dfkbhr.pdf>) MULCH

As with lawfully acquired monopoly power, antitrust law does not prohibit the exercise of lawfully acquired monopsony power, despite its economic costs. Yet antitrust problems do arise when buyers increase their monopsony power by combining forces. Agreements by competing buyers, especially of labor, have attracted enforcement attention. For example, the Department of Justice (DOJ) has challenged a hospital association’s coordinated purchase of so-called “per diem” nursing services, 17 as well as agreements between leading technology firms not to “poach” each other’s employees, resulting in orders prohibiting both practices.18 In 2016, the DOJ and the FTC announced an intention to criminally investigate employer agreements not to hire each other’s employees or to fix wages or terms of employment.19 Outside the realm of government enforcement, private cases have challenged no-poach deals and other horizontal agreements to suppress upstream wages.20 A notable example is the series of cases challenging NCAA rules that place a ceiling on the wages of coaches21 and student-athletes.22 The DOJ, FTC, and private plaintiffs also have challenged buyside cartels in agricultural markets.23

The DOJ also has challenged mergers that threatened to increase monopsony power, frequently among competing buyers of agricultural products including beef buyers,24 pig buyers,25 organic milk buyers,26 chicken processors,27 grain traders,28 and rice millers.29 Beyond agricultural markets, the DOJ has challenged health insurer mergers on the ground that they would, among other effects, suppress the amount paid to physicians and other health care providers.30

### Randomhouse – A2: Inequality – 2AC

#### Monopsonies not key to inequality

Bivens 18 (Josh Bivens is the director of research at the Economic Policy Institute (EPI), Lawrence Mishel is a distinguished fellow at EPI after serving as president from 2002–2017, John Schmitt is senior economist and senior adviser at EPI, April 25, 2018, “It’s not just monopoly and monopsony” Economic Policy Institute, <https://www.epi.org/publication/its-not-just-monopoly-and-monopsony-how-market-power-has-affected-american-wages/>) MULCH

This paper highlights some empirical findings from the new literature on the effect of labor and product market concentration on wages. We address three questions about market concentration that have not always been placed front and center in this literature. The first question is, “Does concentration adversely affect wages at a point in time?” The second question is, “Has concentration grown over time?” The third question is, “Can growing concentration by itself explain a significant portion of the change in wage trends in recent decades?” We find there is evidence to answer “yes” to the first and second questions but not the third. To be clear, the failure to answer affirmatively to the third question is not a criticism of these studies. The studies are not claiming that rising concentration alone can explain wage stagnation or inequality. Yet too many readers have taken these studies’ findings to this conclusion.

Finally, this paper makes two broader points about market power. First, market concentration is not the only source of power—particularly employer power—in markets. Second, even unchanged employer power (like that conferred by market concentration) can play a role in growing wage suppression and inequality if it is accompanied by a collapse of workers’ market power. The new literature on market concentration tells us a lot about employer power, but further exploration of what has happened to workers’ market power remains a key research agenda.

This paper highlights the need to tackle sluggish wage growth and rising inequality with a broad menu of policy interventions that go beyond those provided by competitive models to focus on employer and worker power, and even beyond the antitrust agenda suggested by focusing exclusively on market concentration.

Following are our key conclusions:

Labor market concentration is negatively correlated with wages, but the scope of its downward pressure on wages is limited.

New research shows that labor market concentration is negatively correlated with wages. However, the effect of labor market concentration is comparatively modest when scaled against what we consider the most significant wage trend in recent decades: the growing gap between typical (median) workers’ pay and productivity.

The new literature on market concentration has not yet provided concrete empirical estimates of a key labor market trend of recent decades—rising compensation inequality. This should be a priority for this research agenda in the future.

The new concentration literature does allow us to estimate the effect of market concentration on the share of overall income claimed by labor compensation. These estimates suggest that concentration has not risen enough, nor is its effect on labor’s share of income strong enough, to account by itself for an economically important share of the divergence between economywide productivity and the typical worker’s pay in recent decades.

The new research on labor market concentration implies that this concentration reduced wage growth by roughly 0.03 percent annually between 1979 and 2014, a decline that would explain about 3.5 percent of the total divergence between the median worker’s pay and economywide productivity over the same period.

One important study shows that the “average” labor market is “highly concentrated.” But differences between measures of concentration of the average labor market and the labor market experienced by the average worker have important implications for how to assess the impact of labor market concentration on long-term wage trends. In other words, many labor markets suffer from high degrees of concentration, but most people work in labor markets with only low-to-moderate degrees of concentration.

## FTC Bad

### FTC Cred Bad DA – 2AC

#### The aff link turns that – new cases tradeoff

Reinhart et al 21 (Tara L. Reinhart, Steve Sunshine, David P. Wales, and Julia York, Partners at the Washington, DC office of Skadden, and Bre Jordan, Associate at the Washington, DC office of Skadden, Arps, Slate, Meagher & Flom LLP, law firm, “Lina Khan’s Appointment as FTC Chair Reflects Biden Administration’s Aggressive Stance on Antitrust Enforcement,” 6-18-2021, https://www.skadden.com/-/media/files/publications/2021/06/linakhansappointmentasftcchairreflectsbidenadminis.pdf)

First, a long history of court precedent provides a consistent legal framework for assessing potentially anticompetitive conduct and mergers. Although Ms. Khan and other progressives criticize the consumer welfare standard and advocate for a new, more expansive framework, courts have been applying the same standards under the current antitrust laws for decades. This precedent will be difficult for the FTC to overcome in the near term. She may also be banking on Congress to amend the laws, but it is far from clear whether some of the more radical antitrust bills will pass.

Second, like all antitrust enforcers, Ms. Khan and the FTC will face resource constraints. Bringing antitrust litigation is an expensive and laborious process, often requiring millions of dollars for expert fees and a large army of FTC staff attorneys and taking many months or even years to accomplish. Typically, the FTC can only litigate a handful of antitrust matters at a time. It seems likely that Congress will provide more funding to the FTC in the current environment, but even with these extra resources, the FTC will still have to pick its cases carefully and cannot challenge every deal or every instance of alleged unlawful conduct.

#### FTC’s likely to win now

Howley 21 (Daniel Howley, Technology Editor, Yahoo Finance; **internally citing Penn State Law professor John Lopatka, and George Washington University professor and former FTC chair William Kovacic**; “Facebook’s early antitrust win doesn't let it or Big Tech off the hook,” 6-30-2021, https://news.yahoo.com/facebooks-early-antitrust-win-doesnt-let-it-or-big-tech-off-the-hook-172014765.html)

The FTC will fix its complaint and put Facebook back in the crosshairs

Still, according to Penn State Law professor John Lopatka, this isn’t the end of the line for the FTC’s case.

“I think the FTC absolutely has a chance going forward,” Lopatka said. “What the court essentially says is ‘If you come up with more specific allegations, you get over that hurdle.’ So, you know, I would think that the FTC is going to be able to come up with an amended complaint that cures the defect that the court saw.”

Where the FTC could get tripped up, Lopatka says, is the part of its complaint alleging that Facebook’s decision to not allow competing apps to use its application program interfaces (APIs) was meant to stifle smaller firms. The issue there, however, is that those moves happened years ago and, according to the court, don’t amount to anticompetitive practices, since Facebook more or less has a right to restrict access to its APIs.

While that’s certainly a win for Facebook, the court might still be open to breaking up Facebook — which is a key goal of the FTC. Two major deals in question include Facebook's purchase of photo-sharing site Instagram for $1 billion in 2012 and messaging service WhatsApp for $19 billion in 2014.

Facebook now says too much time has passed to undo the transactions, but Lopatka believes the court might still be willing to force the social network to divest those subsidiaries.

“I think if you read the tea leaves, I think the court would be favorable to the claim with respect to the acquisitions of WhatsApp and Instagram,” he explained. Unwinding Facebook’s acquisitions of WhatsApp and Instagram would be a massive blow to the social networking giant.

That would also satisfy lawmakers and regulators, who have been calling for a breakup of Facebook since their antitrust crusade original began. But, getting to that point will still be incredibly difficult for the FTC, according to Kovacic.

“The judge has indicated to the commission that it will have a different difficult trail to travel to their intended goal,” he said. “I'm sure they've received that message loud and clear.”

#### This chart demonstrating FTC’s refiled market and share definitions proves why winning’s likely – Facebook is grey

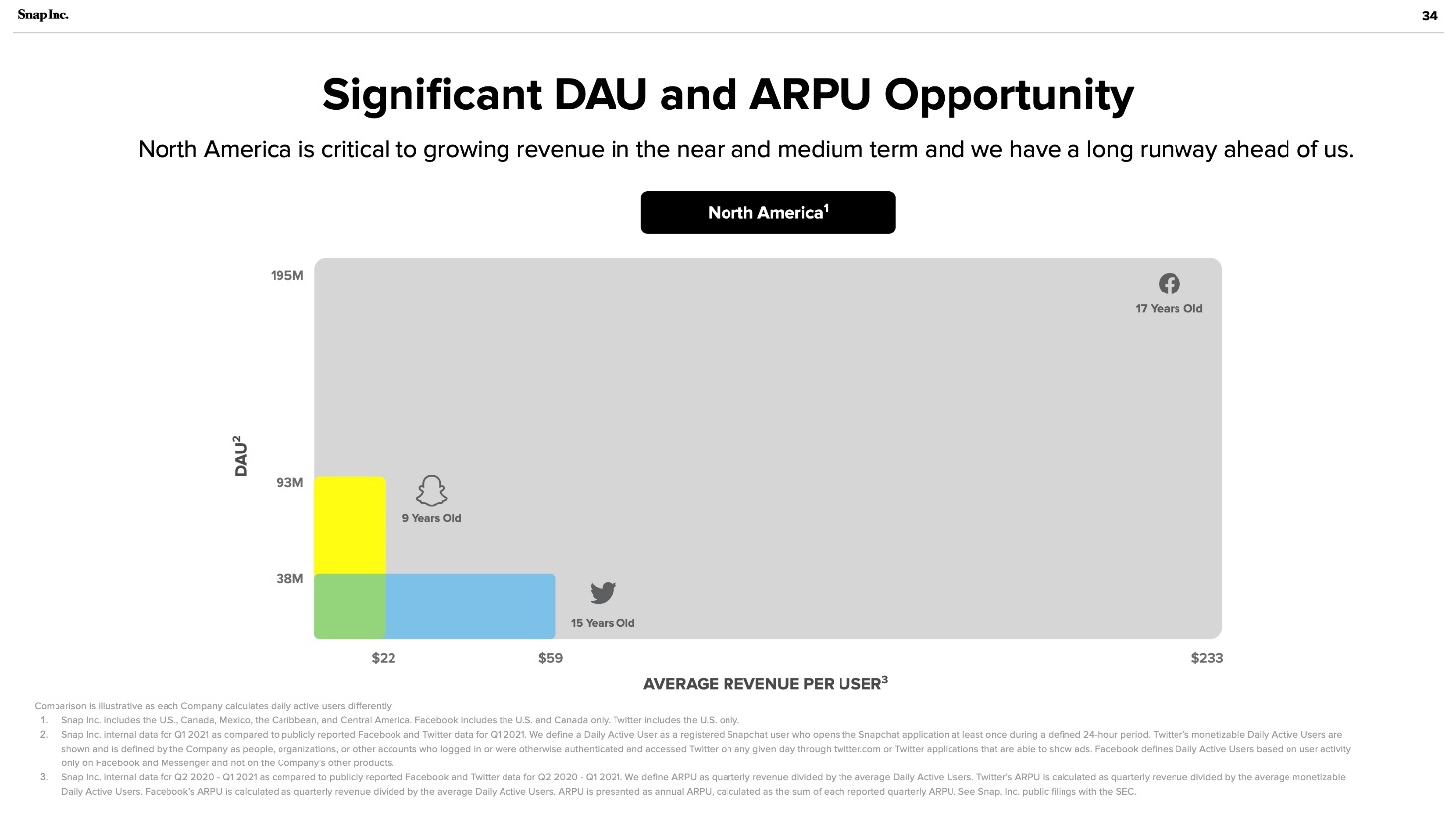
Liss 21 (Daniel Liss, founder and CEO of Dispo, digital disposable camera social network, co-founder and partner of Pilot Labs, venture capital firm, JD Stanford University Law School, MBA Stanford University Graduate School of Business, AB History, Harvard University, “Today’s real story: The Facebook monopoly,” TechCrunch, 8-19-2021, https://techcrunch.com/2021/08/19/todays-real-story-the-facebook-monopoly/)

The problem

According to the court, the FTC must meet a two-part test: First, the FTC must define the market in which Facebook has monopoly power, established by the D.C. Circuit in Neumann v. Reinforced Earth Co. (1986). This is the market for personal social networking services, which includes messaging.

Second, the FTC must establish that Facebook controls a dominant share of that market, which courts have defined as 60% or above, established by the 3rd U.S. Circuit Court of Appeals in FTC v. AbbVie (2020). The right metric for this market share analysis is unequivocally revenue — daily active users (DAU) x average revenue per user (ARPU). And Facebook controls over 90%.

The answer to the FTC’s problem is hiding in plain sight: Snapchat’s investor presentations:



Snapchat July 2021 investor presentation: Significant DAU and ARPU Opportunity. Image Credits: Snapchat

This is a chart of Facebook’s monopoly — 91% of the personal social networking market. The gray blob looks awfully like a vast oil deposit, successfully drilled by Facebook’s Standard Oil operations. Snapchat and Twitter are the small wildcatters, nearly irrelevant compared to Facebook’s scale. It should not be lost on any market observers that Facebook once tried to acquire both companies.

The market Includes messaging

The FTC initially claimed that Facebook has a monopoly of the “personal social networking services” market. The complaint excluded “mobile messaging” from Facebook’s market “because [messaging apps] (i) lack a ‘shared social space’ for interaction and (ii) do not employ a social graph to facilitate users’ finding and ‘friending’ other users they may know.”

This is incorrect because messaging is inextricable from Facebook’s power. Facebook demonstrated this with its WhatsApp acquisition, promotion of Messenger and prior attempts to buy Snapchat and Twitter. Any personal social networking service can expand its features — and Facebook’s moat is contingent on its control of messaging.

The more time in an ecosystem the more valuable it becomes. Value in social networks is calculated, depending on whom you ask, algorithmically (Metcalfe’s law) or logarithmically (Zipf’s law). Either way, in social networks, 1+1 is much more than 2.

Social networks become valuable based on the ever-increasing number of nodes, upon which companies can build more features. Zuckerberg coined the “social graph” to describe this relationship. The monopolies of Line, Kakao and WeChat in Japan, Korea and China prove this clearly. They began with messaging and expanded outward to become dominant personal social networking behemoths.

In today’s refiling, the FTC explains that Facebook, Instagram and Snapchat are all personal social networking services built on three key features:

“First, personal social networking services are built on a social graph that maps the connections between users and their friends, family, and other personal connections.”

“Second, personal social networking services include features that many users regularly employ to interact with personal connections and share their personal experiences in a shared social space, including in a one-to-many ‘broadcast’ format.”

“Third, personal social networking services include features that allow users to find and connect with other users, to make it easier for each user to build and expand their set of personal connections.”

Unfortunately, this is only partially right. In social media’s treacherous waters, as the FTC has struggled to articulate, feature sets are routinely copied and cross-promoted. How can we forget Instagram’s copying of Snapchat’s stories? Facebook has ruthlessly copied features from the most successful apps on the market from inception. Its launch of a Clubhouse competitor called Live Audio Rooms is only the most recent example. Twitter and Snapchat are absolutely competitors to Facebook.

Messaging must be included to demonstrate Facebook’s breadth and voracious appetite to copy and destroy. WhatsApp and Messenger have over 2 billion and 1.3 billion users respectively. Given the ease of feature copying, a messaging service of WhatsApp’s scale could become a full-scale social network in a matter of months. This is precisely why Facebook acquired the company. Facebook’s breadth in social media services is remarkable. But the FTC needs to understand that messaging is a part of the market. And this acknowledgement would not hurt their case.

The metric: Revenue shows Facebook’s monopoly

Boasberg believes revenue is not an apt metric to calculate personal networking: “The overall revenues earned by PSN services cannot be the right metric for measuring market share here, as those revenues are all earned in a separate market — viz., the market for advertising.” He is confusing business model with market. Not all advertising is cut from the same cloth. In today’s refiling, the FTC correctly identifies “social advertising” as distinct from the “display advertising.”

But it goes off the deep end trying to avoid naming revenue as the distinguishing market share metric. Instead the FTC cites “time spent, daily active users (DAU), and monthly active users (MAU).” In a world where Facebook Blue and Instagram compete only with Snapchat, these metrics might bring Facebook Blue and Instagram combined over the 60% monopoly hurdle. But the FTC does not make a sufficiently convincing market definition argument to justify the choice of these metrics. Facebook should be compared to other personal social networking services such as Discord and Twitter — and their correct inclusion in the market would undermine the FTC’s choice of time spent or DAU/MAU.

Ultimately, cash is king. Revenue is what counts and what the FTC should emphasize. As Snapchat shows above, revenue in the personal social media industry is calculated by ARPU x DAU. The personal social media market is a different market from the entertainment social media market (where Facebook competes with YouTube, TikTok and Pinterest, among others). And this too is a separate market from the display search advertising market (Google). Not all advertising-based consumer technology is built the same. Again, advertising is a business model, not a market.

In the media world, for example, Netflix’s subscription revenue clearly competes in the same market as CBS’ advertising model. News Corp.’s acquisition of Facebook’s early competitor MySpace spoke volumes on the internet’s potential to disrupt and destroy traditional media advertising markets. Snapchat has chosen to pursue advertising, but incipient competitors like Discord are successfully growing using subscriptions. But their market share remains a pittance compared to Facebook.

An alternative pleading: Facebook’s market power suppresses wages in the creator economy

The FTC has correctly argued for the smallest possible market for their monopoly definition. Personal social networking, of which Facebook controls at least 80%, should not (in their strongest argument) include entertainment. This is the narrowest argument to make with the highest chance of success.

But they could choose to make a broader argument in the alternative, one that takes a bigger swing. As Lina Khan famously noted about Amazon in her 2017 note that began the New Brandeis movement, the traditional economic consumer harm test does not adequately address the harms posed by Big Tech. The harms are too abstract. As White House advisor Tim Wu argues in “The Curse of Bigness,” and Judge Boasberg acknowledges in his opinion, antitrust law does not hinge solely upon price effects. Facebook can be broken up without proving the negative impact of price effects.

However, Facebook has hurt consumers. Consumers are the workers whose labor constitutes Facebook’s value, and they’ve been underpaid. If you define personal networking to include entertainment, then YouTube is an instructive example. On both YouTube and Facebook properties, influencers can capture value by charging brands directly. That’s not what we’re talking about here; what matters is the percent of advertising revenue that is paid out to creators.

YouTube’s traditional percentage is 55%. YouTube announced it has paid $30 billion to creators and rights holders over the last three years. Let’s conservatively say that half of the money goes to rights holders; that means creators on average have earned $15 billion, which would mean $5 billion annually, a meaningful slice of YouTube’s $46 billion in revenue over that time. So in other words, YouTube paid creators a third of its revenue (this admittedly ignores YouTube’s non-advertising revenue).

Facebook, by comparison, announced just weeks ago a paltry $1 billion program over a year and change. Sure, creators may make some money from interstitial ads, but Facebook does not announce the percentage of revenue they hand to creators because it would be insulting. Over the equivalent three-year period of YouTube’s declaration, Facebook has generated $210 billion in revenue. one-third of this revenue paid to creators would represent $70 billion, or $23 billion a year.

Why hasn’t Facebook paid creators before? Because it hasn’t needed to do so. Facebook’s social graph is so large that creators must post there anyway — the scale afforded by success on Facebook Blue and Instagram allows creators to monetize through directly selling to brands. Facebooks ads have value because of creators’ labor; if the users did not generate content, the social graph would not exist. Creators deserve more than the scraps they generate on their own. Facebook suppresses creators’ wages because it can. This is what monopolies do.

Facebook’s Standard Oil ethos

Facebook has long been the Standard Oil of social media, using its core monopoly to begin its march upstream and down. Zuckerberg announced in July and renewed his focus today on the metaverse, a market Roblox has pioneered. After achieving a monopoly in personal social media and competing ably in entertainment social media and virtual reality, Facebook’s drilling continues. Yes, Facebook may be free, but its monopoly harms Americans by stifling creator wages. The antitrust laws dictate that consumer harm is not a necessary condition for proving a monopoly under the Sherman Act; monopolies in and of themselves are illegal. By refiling the correct market definition and marketshare, the FTC stands more than a chance. It should win.

## Politics – BBB

### Politics – General – 2AC

#### No vote switching --- ideology, party affiliation and commitments overwhelm

Edwards 16 – George C. Edwards III, Distinguished Professor of Political Science and Jordan Chair in Presidential Studies at Texas A&M, 2016, “The Potential of Presidential Leadership”, Study Done for the White House Transition Project

The best evidence is that presidential persuasion is effective only at the margins of congressional decision making. Presidential legislative leadership operates in an environment largely beyond the president’s control and must compete with other, more stable factors that affect voting in Congress in addition to party. These include ideology, personal views and commitments on specific policies, and the interests of constituencies. By the time a president tries to exercise influence on a vote, most members of Congress have made up their minds on the basis of these other factors.

### Biden Good – PC – 2AC

#### Plan’s popular and XO thumps

Financial Press, 8-21 [2021 “The best job-market fix you've never heard of: 'occupational licensing reform' may be having a moment”]

It's an issue progressives and libertarians can agree on. It has unique potential to help service workers at a moment when many of those professions have been upended. And it just got some attention from the White House.

'Occupational licensing reform' may be the most awkwardly-named, little-discussed labor topic in the American economy today. The idea is simple: the number of occupations for which an American worker must be licensed has exploded, to nearly 30% of all jobs now, up from 5% in the 1950s. That throws up barriers to entry, crimps competition, and keeps workers less mobile. Examples include service jobs such as cosmetology, floral arranging, tooth-whitening and others. As the issue gathers more attention, more workers may find it easier to access occupations that might have had requirements keeping them out — and consumers may have a broader set of choices, as well. 'Lots of people lost their jobs during the pandemic, so making sure we don't have artificial barriers to jobs is important,' said Shoshana Weissmann, a fellow and the senior manager of digital media at the R Street Institute, a free-market think tank. 'Also, when you have fewer professionals in an industry, those services can become more expensive.'

The White House, in a July executive order[1], described it this way: 'In certain occupations, such as skilled construction trades, licensing is critical to protecting public health and safety and increasing wages for workers who acquire in-demand skills and knowledge. In other occupations, however, it can impede worker mobility without countervailing benefits.'

There are nearly as many explanations about why occupational licensing is mushrooming as people taking an interest in reforming it. Ryan Nunn is a researcher at the Minneapolis Fed, and previously worked on the issue as part of the Obama administration[2]. In an interview with MarketWatch, Nunn noted that some of the licensing sprawl over the past few decades comes from the country's broad shift to a service-based economy. But, he says, research shows that two-thirds of the increase is due to 'professionalization of the workforce.' 'Occupations are organizing themselves, setting up common standards and industry groups,' Nunn said. 'Then it becomes a short leap to getting licensed. They go to the state legislature and ask for requirements to be licensed. They may see that as the final step.' That evolution is a classic example of what economists call 'rent-seeking.' It privileges those already working in the profession and makes it harder for new people to enter, which means incumbents may be able to charge more for their services, benefitting themselves at the expense of consumers. It may also be the case that giving that professional group what it wants leads to happier outcomes — contributions — for legislators. Weissmann also points to what she calls the 'there oughta be a law!' kind of outrage that so often boils up when something goes wrong. 'That's not always a bad impulse,' she said. But it may be misguided. Take the example of the New Jersey dog groomers. Dozens of dogs died over the course of a decade after being groomed at privately held PetSmart stores around the state, prompting a 2018 local news investigation[3] and a push for legislation that would require licensing for groomers. 'Bijou's Law'[4] failed to pass initially but has been re-introduced. 'There's better ways to achieve a lot of the same outcomes that people want,' Weissmann told MarketWatch: inspections, for example. (Dog-grooming safety seems to strike a special chord for Americans: a recent Twitter kerfluffle erupted after a local television reporter in Washington, DC, seemed to suggest dogs were being murdered by groomers.)

Nunn points to North Carolina State Board of Dental Examiners v. Federal Trade Commission, a Supreme Court case decided in 2016, as an example of overreach and reform. The high court agreed with the FTC[5] that a state licensing board made up of practitioners needed some supervision. 'Their concern was the state was delegating too much authority to the industry,' Nunn said in a MarketWatch interview. 'The dentists got to regulate themselves.'

Even though nearly all licensing is done on the state level, Nunn believes there's a role for the federal government to play, as the FTC did in that North Carolina case. There's also the bully pulpit that the White House and others can command, he said — issuing an executive order, as the Biden administration did, or convening a task force of state leaders, as the Obama administration did.

#### PC fails and doing more benefits the agenda

Waldman 20 – Paul Waldman, opinion writer for the Plum Line blog, “Joe Biden has to move fast,” 12/3/20, The Washington Post, https://www.washingtonpost.com/opinions/2020/12/02/joe-biden-has-move-fast/

Once you realize that the public is neither aware of nor particularly concerned about process questions, you can stop worrying about whether Republicans will squawk at this appointment or that executive order — because they’ll squawk no matter what you do. If it’s a good idea and you think the results will be good, then just do it. As quickly and comprehensively as possible.

As David Roberts of Vox observes: In 2009, Obama and his aides made the mistake of thinking that their major initiatives had to be rolled out one at a time in sequence, because he had a finite store of “political capital” that had to be spent carefully. But political capital is not something that exists apart from any particular issue; it isn’t a special sauce that has to be poured on a policy in order to make it palatable.

And with the parties as polarized and unified as they are, political capital has become all but meaningless. There may have been a time when a popular president possessed so much capital that a senator from the opposition party would feel compelled to support him on part of that president’s agenda, but that time is long gone. There is no account Biden can draw on to turn Republican “no” votes into “yes.”

So setting up a series of high-profile policy battles may be the opposite of what Biden should do. The unfortunate fact is that he may not have the opportunity to do much in the way of big legislation on health care or climate change or anything else, and if he has only executive power to work with, it makes it all the more urgent to move quickly.

Which means getting staff in place immediately and then unleashing them. The Revolving Door Project argues that Biden should give as much authority as possible to the agencies to let them dismantle their particular corners of the Trump legacy on their own, because the task “simply will not happen if approached sequentially or micromanaged” by a White House staff with limited bandwidth.

That means moving on every policy area all at once. There’s nothing to be gained by putting off any part of Biden’s agenda. Whatever he can do given the limits of his power, he should do as soon as possible, in a flood of policymaking.

### Courts – 2AC

#### Courts don’t link – avoids gridlock, horse-trading and takes the blame for elected branches

Ward 9 [Artemus, Professor – Political Science – Northern Illinois University “Political Foundations of Judicial Supremacy: The Presidency, the Supreme Court”, Congress & the Presidency, Jan-Apr, (36)1; p. 119]

After the old order has collapse the once- united, new-regime coalition begins to fracture as original commitments are extended to new issues. In chapter 3 Whittington combines Skowronek's articulation and disjunctive categories into the overarching "affiliated" presidencies as both seek to elaborate the regime begun under reconstructive leaders. By this point in the ascendant regime, Bourts are staffed by justices from the dominant ruling coalition via the appointment process - and Whittington spends time on appointment politics here and more fully in chapter 4. Perhaps counter-intuitively, affiliated political actors - including presidents - encourage Courts to exercise vetoes and operate in issue areas of relatively low political salience. Of course, this "activism" is never used against the affiliated president per se. Instead, affiliated Courts correct for the overreaching of those who operate outside the preferred constitutional vision, which are often state and local governments who need to be brought into line with nationally dominant constitutional commitments. Whittington explains why it is easier for affilitated judges, rather than affiliated presidents, to rein in outliers and conduct constitutional maintenance. The latter are saddled with controlling opposition political figures, satisfying short-term political demands, and navigating intraregime gridlock and political thickets. Furthermore, because of their electoral accountability, politicians engage in position-taking, credit-claiming, and blame-avoidance behavior. By contrast, their judicial counterparts are relatively sheltered from political pressures and have more straightforward decisional processes. Activist Courts can take the blame for advancing and legitimizing constitutional commitments that might have electoral costs. In short, a division of labor exists between politicians and judges affiliated with the dominant regime.

#### Plan’s announced in June

Freeman 16 – Jody Freeman, Professor of Law and Director of the Environmental Law Program at Harvard Law School, “Update on the Clean Power Plan: The Knowns and Unknowns”, American College of Environmental Lawyers, 3-2, http://www.acoel.org/post/2016/03/02/Update-on-the-Clean-Power-Plan-The-Knowns-and-Unknowns-.aspx

Next Steps and Timing of Litigation

Whatever the composition of the D.C. Circuit panel, however, and whatever it decides, the losing parties might seek en banc review in the D.C. Circuit. The State and industry challengers would be almost certain to do so, because delay favors their side. This is because the Supreme Court took the unusual step of staying the rule not just until the D.C. Circuit rules on the merits, but for longer: until the Supreme Court either denies certiorari or grants review and decides the case. Delay means the Stay remains in force, which means the deadline for filing compliance plans keeps being pushed off, which means momentum slows, which favors those opposed to the CPP. En banc review is rarely granted, however, and the D.C. Circuit may be reluctant to further delay things by providing it when the Supreme Court has already associated itself with the case (by granting the Stay and making it all but certain review will be granted).

What all of this means is that the earliest the Supreme Court could decide the case--given the time necessary for the cert petition, briefing, argument and deliberation--is likely to be June 2017, and the latest the Court is likely to decide the case is June 2018. That means the Stay could remain in place for more than two years.

### BBB – 2AC

#### Robust BBB won’t pass – no Dem comprise and tons of thumpers

Foran 1-1 [Clare Foran is a congressional Reporter for CNN Politics 1-1-2022 https://www.cnn.com/2022/01/01/politics/congress-agenda-2022/index.html]

Congress has a lengthy to-do list that lawmakers will have to tackle when they return to Washington for the new year after the holiday season.

Democrats, who control the White House and hold narrow majorities in the House and Senate, are under growing pressure to deliver on promises to voters. The clock is ticking as the 2022 midterm elections approach when the balance of power could change and the party's opportunity to take action could slip away.

But Democrats face major obstacles to implementing their agenda, particularly in the Senate where party control is split 50-50 and Democrats need every single member of their caucus to be unified if they want to pass legislation without Republican votes under a process known as reconciliation.

Democrats and Republicans will confront a government funding deadline in mid-February and will need to pass legislation before funding expires. This comes after Congress acted in December to narrowly avoid a shutdown by passing a stopgap bill to extend funding through February 18.

Here's a look at some of the other key issues on the horizon in the new year:

Democrats will try to pick up the pieces on the Build Back Better Act

West Virginia Democratic Sen. Joe Manchin, a key swing vote, dealt his party a major blow when he announced in late December that he was a "no" on the Build Back Better Act, legislation championed by President Joe Biden to expand the social safety net and fight the climate crisis.

Now, Democratic leaders have to figure out what happens next. They are vowing not to give up, but it's not yet clear what Democrats might be able to accomplish.

Biden has said that he still thinks "there's a possibility of getting Build Back Better done" and has insisted that he and Manchin will "get something" finished after the West Virginia moderate undercut the President's agenda. House Speaker Nancy Pelosi has said that Democrats "will not let this opportunity pass."

Democratic leaders plan to keep the pressure on. In the wake of Manchin's announcement, Senate Majority Leader Chuck Schumer indicated to his caucus that he plans to push ahead with a vote on the legislation that will force Manchin to go on the record on the Senate floor.

"The Senate will, in fact, consider the Build Back Better Act very early in the new year so that every member of this body has the opportunity to make their position known on the Senate floor, not just on television," Schumer told members of his caucus in a letter on December 20.

"We are going to vote on a revised version of the House-passed Build Back Better Act -- and we will keep voting on it until we get something done," he wrote.

One option Democrats may look at is whether they can try to pass any of the priorities contained within the Build Back Better Act, even if it means advancing them alone or as part of a significantly scaled back version of the legislation.

CNN has reported that Manchin has told colleagues that he would keep talking. But the senator has indicated that he would not quickly get behind a scaled-back version of the plan, arguing that it should instead go through the committee process before trying to move it through the Senate via the filibuster-proof reconciliation process. That position underlines the major hurdles ahead for Democrats if they hope to advance even a narrow version of the legislation.

When asked in a recent interview on Fox News if Democrats are open to scaling back the bill or passing various pieces on a stand-alone basis, Democratic Sen. Ben Cardin of Maryland said "that's a strategy decision that is being negotiated. We are open to a way to reach the finish line."

Progressives in the House in the meantime have called on Biden to turn to executive action while lawmakers try to reach a deal.

"The White House must continue to act on a parallel track by using the President's incredibly powerful tool of executive action," the Progressive Caucus said in a statement in late December. "The legislative approach, while essential, has no certainty of timing or results — and we simply cannot wait to deliver tangible relief to people that they can feel and will make a difference in their lives and livelihoods."

Progressive Caucus Chairwoman Pramila Jayapal, a Democrat from Washington state, has also made clear that House progressives would not accept a smaller version of the Build Back Better Act, putting down a clear guard rail as negotiations start to resume.

"No one should think that we are going to be satisfied with an even smaller package that leaves people behind or refuses to tackle critical issues like climate change," Jayapal said in late December.

Senate Democrats to try again on voting legislation but face uphill battle

Schumer has also told members of his caucus to get ready for the Senate to try again on voting legislation in the new year -- but Democrats face major obstacles that threaten to doom the effort as a result of Republican opposition and limitations they face due to their narrow majority and constraints from Senate rules.

In his letter to Senate Democrats, Schumer wrote, "after the 117th Congress resumes in January, the Senate will consider voting rights legislation, as early as the first week back."

The issue for Democrats is that most legislation requires at least 60 votes to pass in order to overcome a filibuster. Democrats only control 50 seats in the chamber and there are not 10 Republicans willing to vote with Democrats to pass voting legislation. As a result, Senate Republicans have blocked attempts by Democrats to advance voting and elections bills multiple times already.

Schumer indicated in his letter that Democrats may need to try to change Senate rules as a result.

"If Senate Republicans continue to abuse the filibuster and prevent the body from considering this bill, the Senate will then consider changes to any rules which prevent us from debating and reaching final conclusion on important legislation," he wrote.

But Manchin as well as moderate Arizona Democrat Kyrsten Sinema have both repeatedly made clear they oppose getting rid of the filibuster, creating a key hurdle for Democrats eager to change Senate rules.

Manchin told CNN in mid-December that any rules changes would have to be done on a bipartisan basis, meaning he is still opposed to nuking the filibuster along party lines to pass voting legislation.

Senate Minority Leader Mitch McConnell recently told reporters that "yes" he is convinced that no Republicans will engage in talks with Democrats to change Senate rules to do a voting rights bill.

House January 6 select committee to continue investigation

The House select committee created to investigate the deadly January 6 attack on the Capitol will continue its work in the new year. It is not yet clear when the investigation will be complete, but Democrats may face growing pressure to reach a conclusion as the 2022 midterm elections near.

The committee has issued a long list of subpoenas in an effort to find out information and seek testimony -- and Democrats have taken steps to show there will be consequences for non-compliance.

In October, the Democratic-led House of Representatives voted to hold Steve Bannon in criminal contempt after he defied a subpoena from the committee. In mid-December, the House voted to recommend that the Department of Justice pursue criminal charges against former White House chief of staff Mark Meadows for failing to appear for a deposition with the select committee.

### Warming Impact – 2AC

#### Global and non-federal cuts solve

Harder 20 [Amy Harder is an energy and climate change reporter at Axios. She is the author of the weekly Harder Line column and she covers the industry’s biggest news stories 12-7-2020 https://www.axios.com/biden-paris-deal-five-years-fd6b5b28-0b18-4794-b112-5776dbafccf4.html]

Much of the world has moved forward, despite Trump’s retreat.

Europe has been pushing aggressive climate policy over the last five years, and recent comments suggest it may not let America lead like it has in the past.

“Europe will be at the forefront of brokering ambitious commitments,” said European Commission President Ursula von der Leyen in comments last month. “The U.S. is also well placed to support us.”

This fall, China, South Korea and Japan all announced aggressive goals to drastically cut emissions over the next three decades.

These announcements, critical given that they’re coming from energy-hungry Asia, were made in anticipation of a Biden presidency, said one former U.S. diplomat.

“The analysis they were reading was that Biden would win. I think if the analysis had been the other way, you wouldn’t have seen these announcements forthcoming.”

— Jonathan Pershing, who worked on the Paris deal under Obama

The intrigue: The official U.S. commitment to the deal is not expected immediately in the new administration, according to Pershing and other experts familiar with the process.

That's because it takes time — and technical experts — to determine what policies are possible and how much emissions reduction would result.

"There will likely be an announcement of intent and then delivery of the plan within the first year," Pershing said.

By the numbers: Given the limits of Biden’s domestic political agenda, the pledge is likely to lean more heavily than ever before on non-federal action, which there's been a lot of over the last four years.

Action by states, cities and private business could cut U.S. emissions up to 37% by 2030 compared to 2005 levels, according to a 2019 report by a consortium of environmental groups and former state leaders.

#### Not existential AND their models fail.

Piper 19---Kelsey Piper, citing John Halstead climate change mitigation researcher at the Founders Pledge. [Is climate change an "existential threat" — or just a catastrophic one? 6-28-2019, https://www.vox.com/future-perfect/2019/6/13/18660548/climate-change-human-civilization-existential-risk]

I also talked to some researchers who study existential risks, like John Halstead, who studies climate change mitigation at the philanthropic advising group Founders Pledge, and who has a detailed online analysis of all the (strikingly few) climate change papers that address existential risk (his analysis has not been peer-reviewed yet).

Halstead looks into the models of potential temperature increases that Breakthrough’s report highlights. The models show a surprisingly large chance of extreme degrees of warming. Halstead points out that in many papers, this is the result of the simplistic form of statistical modeling used. Other papers have made a convincing case that this form of statistical modeling is an irresponsible way to reason about climate change, and that the dire projections rest on a statistical method that is widely understood to be a bad approach for that question.

Further, “the carbon effects don’t seem to pose an existential risk,” he told me. “People use 10 degrees as an illustrative example” — of a nightmare scenario where climate change goes much, much worse than expected in every respect — “and looking at it, even 10 degrees would not really cause the collapse of industrial civilization,” though the effects would still be pretty horrifying. (On the question of whether an increase of 10 degrees would be survivable, there is much debate.)

Does it matter if climate change is an existential risk or just a really bad one?

That last distinction Halstead draws — of climate change as being awful but not quite an existential threat — is a controversial one.

That’s where a difference in worldviews looms large: Existential risk researchers are extremely concerned with the difference between the annihilation of humanity and mass casualties that humanity can survive. To everyone else, those two outcomes seem pretty similar.

To academics in philosophy and public policy who study the future of humankind, an existential risk is a very specific thing: a disaster that destroys all future human potential and ensures that no generations of humans will ever leave Earth and explore our universe. The death of 7 billion people is, of course, an unimaginable tragedy. But researchers who study existential risks argue that the annihilation of humanity is actually much, much worse than that. Not only do we lose existing people, but we lose all the people who could otherwise have had the chance to exist.

In this worldview, 7 billion humans dying is not just seven times as bad as 1 billion humans dying — it’s much worse. This style of thinking seems plausible enough when you think about past tragedies; the Black Death, which killed at least a tenth of all humans alive at the time, was not one-tenth as bad as a hypothetical plague that wiped us all out.

Most people don’t think about existential risks much. Many analyses of climate change — including the report Vice based its article on — treat the deaths of a billion people and the extinction of humanity as pretty similar outcomes, interchangeably using descriptions of catastrophes that would kill hundreds of millions and catastrophes that’d kill us all. And the existential risk conversation can come across as tone-deaf and off-puttingly academic, as if it’s no big deal if merely hundreds of millions of people will die due to climate change.

Obviously, and this needs to be stressed, climate change is a big deal either way. But there are differences between catastrophe and extinction. If the models tell us that all humans are going to die, then extreme solutions — which might save us, or might have unprecedented, catastrophic negative consequences — might be worth trying. Think of plans to release aerosols into the atmosphere to reflect sunlight and cool the planet back down in the manner that volcanic explosions do. It’d be an enormous endeavor with significant potential downsides (we don’t even yet know all the risks it might pose), but if the alternative is extinction then those risks would be worth taking.

But if the models tell us that climate change is devastating but survivable, as most models show, then those last-ditch solutions should perhaps stay in the toolkit for now.

Then there’s the morale argument. Defenders of overstating the risks of climate change point out that, well, understating them isn’t working. The IPCC may have chosen to maintain optimism about containing warming to 2 degrees Celsius in the hopes that it’d spur people to action, but if so, it hasn’t really worked. Maybe alarmism will achieve what optimism couldn’t.

That’s how Spratt sees it. “Alarmism?” he said to me. “Should we be alarmed about where we’re going? Of course we should be.”

Swedish teenager Greta Thunberg has taken an arguably alarmist bent in her advocacy for climate solutions in the EU, saying, “Our house is on fire. I don’t want your hope. ... I want you to panic.” She’s gotten strong reactions from politicians, suggesting that at least sometimes a relentless focus on the severity of the emergency can get results.

So where does this all leave us? It’s worthwhile to look into the worst-case scenarios, and even to highlight and emphasize them. But it’s important to accurately represent current climate consensus along the way. It’s hard to see how we solve a problem we have widespread misapprehensions about in either direction, and when a warning is overstated or inaccurate, it may sow more confusion than inspiration.

Climate change won’t kill us all. That matters. Yet it’s one of the biggest challenges ahead of us, and the results of our failure to act will be devastating. That message — the most accurate message we’ve got — will have to stand on its own.

# 1AR

## Adv---Federalism

### AT: I/L

#### Link is wrong---our arg is about national unity---Congress does not supplant executive influence, it complements it!

#### National unity is a pre-requisite to effective foreign policy – absence of unified behavior undermines credibility, legitimacy, and resolve---only a risk we make executive foreign policy better.

Foster 20 [Gregory D. Foster is a professor at the National Defense University, a West Point graduate, 11-23-2020 https://www.defenseone.com/ideas/2020/11/we-have-met-enemy-and-it-us-struggle-americas-soul/170285/]

That President-elect Biden, when he assumes office, must necessarily focus his attention and that of the American public on domestic affairs can only be to the country’s decided strategic benefit. As Jan. 20 approaches, the United States suffers from four years of self-imposed disarray and disrespect abroad and acute discord at home – a superpower emeritus in the making, if not already in being. The most serious threat confronting us today is not China or Russia or Iran or North Korea – or any of the self-deluding, self-serving party lines national security bureaucrats inside and outside the Trump administration have force-fed us since 2017. It is us, the American people, and those who profess to represent, guide, and act for us.

Recent Pew Research Center polls — not to mention the just-completed election — show how politically and ideologically polarized we are along almost all lines: gender, race and ethnicity, age, and education foremost among them. Republicans hate Democrats, liberals hate conservatives, and nobody likes anybody very much. Eighty-seven percent of us are dissatisfied with the way things are going in the country. Seven out of ten Americans are angry and nearly seven of ten fearful, while only half are hopeful and 20 percent proud, with the state of the country. Public trust in federal government stands at a mere 20 percent, a low not seen for more than a decade. Adding blunt insult to self-inflicted injury, views of the United States abroad are at record lows in the United Kingdom, France, Germany, Japan, Canada, and Australia, with the median favorable view of us in 13 countries around the world being just 34 percent.

The best, if not the only, path to recovery from the strategic dysfunction of the past four years starts here at home. We must restore our dignity, reestablish a sense of oneness, remind ourselves that we are our brothers’ and sisters’ keepers, regenerate the elusive quest for equality of opportunity, and re-earn our claims to exceptionalism. To be sure, U.S. foreign policy activities will continue apace, as we appoint key cabinet and sub-cabinet officials at State, Defense, and the intelligence community; reaffirm our lapsed commitments to various multilateral institutions and international agreements; and reach out diplomatically to key allies and adversaries alike. But attending first and foremost to domestic affairs must be seen not as coming at the expense of our strategic posture, but as materially enhancing it.

The place to start, in fact, in reinvigorating ourselves strategically is to recognize the Preamble to the Constitution for what it is: America’s security credo. It calls not simply for providing for the common defense, but for forming a more perfect union, establishing justice, ensuring domestic tranquility, promoting the general welfare, and securing the blessings of liberty (for ourselves and our posterity). The only one of these founding precepts that is demonstrably internationally oriented is providing for the common defense — meaning, presumably, protecting ourselves, our sovereignty, and our territorial integrity. All the rest focus on human well-being within the United States, the visionary link between individual security on the one hand and national security on the other, and recognition of the natural rights all human beings, citizens and non-citizens alike, deserve to enjoy strictly by virtue of being human: national unity; a commitment to fair and equitable treatment for all; enduring peace in the streets and in the corridors of power; inclusive well-being for haves and have-nots alike; freedom from fear and danger, need and want, and freedom to achieve self-fulfillment. These are the things, collectively, that constitute what we might call assured security; and it is providing for assured security that is – or ought to be – the overarching aim of U.S. strategy.

When the Biden administration enters office, it will find no national strategy worthy of the name. The most recent White House National Security Strategy, the Trump administration’s half-hearted bureaucratic effort to fulfill a legal requirement, has been moribund since John Bolton replaced H.R. McMaster as presidential national security adviser. As such, the only “blueprint” of sorts for America’s national security posture is the 2018 James Mattis-directed National Defense Strategy, which, by law, we are stuck with until 2022. The NDS is nothing but a crass polemic, an ideological tract that seeks to revive the Cold War as a pretext for eternally gluttonous defense spending and the perpetuation of the tired American way of war preferred by parochial generals who, history shows, invariably prepare only for the wars of the past.

Ironically, two features of the NDS offer intellectual hooks for rethinking and remedial action by the incoming administration. The first is the NDS assertion that the era now facing us is one of Great Power Competition from revisionist powers – China and Russia primarily – who seek to unseat us from our deserved position of global primacy. The embedded received truth is that, objectively speaking, the United States remains a great power (a superpower even, even if not the only one) characterized by our recognized standing (as a permanent member of the UN Security Council); our massive wherewithal, military and non-military; our global sustainable reach, military and non-military; and our widespread influence. The implicit question this raises is what makes a great power great. The answer, as some have suggested, and the challenge before us then, is normative behavior – practicing what we preach to others, leading by the inspirational power of our example.

The second ironically useful feature of the NDS is its call for lethality — presumably connoting killing power and destructive capacity — as the principal pillar of our strategic posture. This stands in stark contrast to the Obama administration’s final National Security Strategy document, issued in 2015, which identified values as a national interest and a major pillar of our strategic posture. “We will lead by example,” says the document’s introductory section. “The strength of our institutions and our respect for the rule of law sets an example for democratic governance. When we uphold our values at home, we are better able to promote them in the world. This means safeguarding the civil rights and liberties of our citizens while increasing transparency and accountability.” It continues: “We face continued challenges, including political dysfunction in Washington that undermines national unity, stifles bipartisan cooperation, and ultimately erodes the perception and strength of our leadership abroad. American leadership is always most powerful when we are able to forge common ground at home around key national priorities.”

Note the difference: values, not lethality, as a guiding strategic precept. This sets the stage for coming to grips with what strategy and the strategic enterprise is all about. For starters, strategy is, in important measure, about the effective management of perceptions – projecting imagery, manipulating symbols, shaping “reality.” We all – policymakers, politicians, institutions, citizen groups – do it all the time, though frequently not well nor with sophistication or subtlety. Strategically, we want to be able to orchestrate how audiences, domestic and international, see us: credibility, legitimacy, competence, reliability, selflessness, resolve good; arrogance, hypocrisy, ineptitude, unreliability, expediency, selfishness bad.

This leads us to acknowledge that, in even more important measure, strategy is about the effective exercise of power to get what we want, to get our way, to elicit deference from others. Practicing what we preach, leading by example, is the easiest, least expensive way to accumulate power, achieve lasting influence, and thereby solidify our position in the cosmic, hierarchical pecking order of states that remain the principal actors in the international system. There is more, in other words, than the sticks of coercive power and the carrots of persuasive power; there also is the inspirational power that comes from actually being who we think and say we are.

### AT: A/C

#### Addressing spillovers solves – jumpstarts active fed role and stops Congressional buck-passing – Sack and Finkle

#### It’s reversible

Dvorak 20 [Petula Dvorak, WaPo columnist, 9-10-2020 https://www.washingtonpost.com/local/our-brief-moment-of-national-unity-after-the-911-attacks-was-just-that--brief-can-we-ever-get-it-back/2020/09/10/91e93af8-f376-11ea-bc45-e5d48ab44b9f\_story.html]

“We are dividing into hostile [factions] ~~tribes~~ cheering against each other,” wrote retired Gen. Jim Mattis, President Trump’s former secretary of defense, “fueled by emotion and a mutual disdain that jeopardizes our future, instead of rediscovering our common ground and finding solutions.” Mattis, after four decades in the Marine Corps leading combat missions overseas, knows who our most dangerous enemy is. “What concerns me most as a military man, coming out of a diverse yet unified culture, is not our external adversaries; instead, it is our internal divisiveness,” he wrote in his 2019 book, “Call Sign Chaos: Learning to Lead.” “It’s the grift, the racism and the ugliness — all of it — that’s a threat,” said Sheri Zachary, 55, whose husband — an Air Force colonel at the time — was in the Pentagon during the attack and was familiar with all the tactics, tribalism and ugliness of terrorists attacking the United States. But now, she sees those as traits of this administration. “The problem has become that the threat we were united against back then has become internal,” she said. Zachary’s husband, retired Col. Todd Zachary, called her that morning about 9:30 while she was staying home from work with a sick son. “He asked me, ‘Are you watching the news?’ And I turned the TV on and there it was. New York, the twin towers. And then my husband said he had to go,” she said, figuring the Pentagon would be a busy place that day. Then, as she was watching the news, a new billow of smoke appeared from a different building. The Pentagon. She didn’t hear from her husband all day. She and her 10-year-old son kept watching the TV feeds, hoping to see his little red Miata drive out of the Pentagon parking lot. Just before dusk, an unfamiliar car pulled up to their driveway. Her husband got a ride home after he escaped the burning building. That day is a history lesson for the students at the Philadelphia high school where she’s a librarian now. To celebrate or not when the enemy falls? The kids who partied when bin Laden was killed. Same for Petrovich, who teaches college students too young to have known that strong, united America, that World War II we’re-all-in-this-together feeling of unity that revisited our nation for a brief moment in the autumn of 2001. “To them, it’s like Pearl Harbor was to me, it’s just a note in a history book,” Petrovich said. “They don’t have that motivation that united us at one point. That motivation point, that trickle-down effect of shared purpose, isn’t part of their lives.” But it can be. “It’s going to take some time, it’s going to take patience and forgiveness on the part of people, especially on the left,” Sheri Zachary said. “Everybody who unfriended anybody on Facebook, they have to let those people back into their lives. We have to repair those small things to begin healing our nation. It may take a generation.” And it’s going to take a rebranding of that motto that everyone loved to use 19 years ago. Because we forgot to use the second half of that biblical reference when we plastered it on all those buttons, bumper stickers, T-shirts and commemorative coins. It’s “United We Stand.” And “Divided We Fall.”

## FTC Cred Bad

### 1AR---Thumpers

#### Dark pattern enforcement just increased

Barnett 11-8 [Keith Barnett, Troutman Pepper, 11-8-2021 https://www.jdsupra.com/legalnews/ftc-to-ramp-up-enforcement-on-5405976/]

On October 28, the Federal Trade Commission (FTC) issued a new policy statement on autorenewal and negative option marketing.

As its press release title indicates, the FTC intends to “ramp up enforcement” against companies offering subscription services via an autorenewal or negative option offer. Signaling its primary concerns, the FTC’s policy statement focuses on three points:

Clear and Conspicuous Disclosures. Any autorenewal or negative option offer should clearly and conspicuously disclose all material terms, including the price, whether the price will increase after a trial period, any recurring charges, the deadline for the consumer to stop the charges, payment submission date(s) for each charge, and all information necessary to cancel the contract.

Express and Informed Consumer Consent. A company offering an autorenewal or negative option should obtain the consumer’s express and informed consent, which should be obtained separately from any other consents and not obtained via any detracting or contradictory language that muddles the consumer’s ability to give informed consent.

Ease of Cancellation. A company offering an autorenewal or negative option should provide the consumer with a simple and efficient mechanism to cancel the subscription and offer that mechanism via the same media (e.g., mobile application or website) that the consumer used to enroll in the subscription plan.

FTC Bureau of Consumer Protection Director Samuel Levine said: “Today’s enforcement policy statement makes clear that tricking consumers into signing up for subscription programs or trapping them when they try to cancel is against the law.”

The press release further notes that the FTC has brought cases challenging a variety of illegal subscription practices. The FTC has sued companies that hid important payment information, that made consumers wait on hold or listen to lengthy ads before they could cancel, that converted free trials to paid subscriptions before the free trial ended, and that failed to disclose that widely advertised material benefits of the subscription were no longer available.

Our Take. The FTC’s press release and policy statement signal again that U.S. consumer protection agencies intend to ramp up enforcement of the laws and regulations that govern autorenewal and negative option marketing.

#### Biden’s XO limited state action immunity

Higgins 21 [Sean Higgins is a research fellow at the Competitive Enterprise Institute, 7-9-2021 https://cei.org/blog/biden-is-right-to-call-for-rolling-back-occupational-licensing-and-non-compete-agreements/]

President Biden’s executive order today calling for occupational licensing and employment non-compete agreements to be rolled back is a good idea that could benefit individual workers. Whether the White House actually has the authority to regulate them is a different question, but at least it is addressing the right issue: expanding the freedoms of individual workers.

The proposals were part of the Biden administration’s “Executive Order on Promoting Competition in the American Economy.” I’ll leave it to others to dissect the order’s proposals outside of labor policy, but non-compete agreements and occupational licensing are in most cases limits on competition. They are barriers that prevent workers from being able to get the maximum value for the commodity they sell: their labor.

Non-compete clauses are contract provisions that businesses often insist that workers sign prohibiting them for working for a competitor for a certain period of time after that worker is no longer with the first businesses. Studies vary on often businesses do this. The Treasury Department estimated in 2016 that 16 percent require them. The Biden administration cites research by the union-backed Economic Policy Institute that puts it at about 32 percent. Whatever the correct figure actually is, it is too high.

Non-compete clauses are often justified by employers on the grounds that they have made an investment in the worker’s training and therefore deserve to recoup that. However, the practice has spread across all industries and it serves to prevent workers from being able to bid up the value of their labor.

This is bad for the economy and bad for consumers. It is not even clear that non-compete clauses are that good for business. A company that uses non-compete agreements might be able to prevent a rival from luring away, say, a talented engineer. But such provisions also prevent the same company from hiring talented engineers away from a rival. As a result, the pool of available workers becomes shallower and job openings are more likely to go unfilled.

State job licensing requirements are better justified, at least in theory. Certain professions affect public health and safety, after all. It is perfectly reasonable to require nurses or emergency medical technicians (EMTs) to be licensed. But as with non-compete requirements, the practice has spread far beyond those instances and now cover 25-30 percent of all professions according a 2018 Federal Trade Commission (FTC) report. Workers in numerous states require professions like beautician, tax preparer, and tour guide to be licensed. There is bipartisan consensus that these practices should be limited.

The problem with these practices is that it is unclear what can be done about them at the federal level. There is no precedent for the federal government regulating either. It has generally been accepted by the courts that states have the right to license professions and are exempt from antitrust regulations when doing it. The Supreme Court did put some limits on that in a 2015 case called North Carolina State Board of Dental Examiners v. Federal Trade Commission. The case found that if the licensing boards’ members included “active market participants”—businesses directly affected by the board’s actions—then they weren’t exempt from antitrust regulations. But that’s about it. The FTC’s 2018 report accepted that the practice of licensing was the purview of states. It proposed that the federal government promote interstate compacts to job licenses more portable.

The Biden administration’s executive order calls on the FTC to “ban or limit non-compete agreements” and “ban unnecessary occupational licensing.” That’s unprecedented and to do it, the FTC would have to show that the practices create unavoidable injury to consumers and are not outweighed by any benefits to the public of the state’s regulation. In the case of job licensing requirements, it is likely that those that provide clear public health and safety benefits like nurses or EMTs would be protected, but licenses for beauticians could be challenged. Federal regulation of non-compete clauses would be harder for the administration to make the case for, since, while the clauses hurt workers, the impact on consumers is more indirect and harder to quantify.

#### Energy antitrust is coming and thumps

Miller 9-7 [Evan Miller, Associate in the Complex Commercial Litigation Practice Group at Vinson & Elkins LLP, JD from the Boston University School of Law, BA from The George Washington University, “FTC Letter Signals Increased Scrutiny of Oil & Gas M&A Activity”, JD Supra, 9/7/2021, https://www.jdsupra.com/legalnews/ftc-letter-signals-increased-scrutiny-2957307/]

In a recent exchange of letters with the White House, the chair of the Federal Trade Commission (“FTC”) signaled her intent to ramp up antitrust enforcement in the oil and gas industry. The move comes as part of a broader shift in priorities at the FTC in evaluating mergers and is in line with the Biden administration’s recent efforts to increase antitrust enforcement across industries (about which V&E has previously written). While calls for FTC action to combat high gas prices are fairly common from new administrations and Congress, the agency’s recent response includes specific action items that suggest deviations from past policy. These changes could have significant effects on the regulatory environment for energy companies, especially for the retail fuels sector. Indeed, practitioners who regularly represent oil and gas companies before the FTC have noted that they are already receiving inquiries in line with the chair’s letter.

Background

On August 11, 2021, White House National Economic Council Director Brian Deese, who is also head of the new White House Competition Council, issued a letter to the FTC raising concerns about “divergences between oil prices and the cost of gasoline at the pump” during this past summer season. The letter did not provide any support for this assertion but urged the FTC to use “all of its available tools to monitor the U.S. gasoline market and address any illegal conduct that might be contributing to price increases for consumers at the pump.”

On August 25, 2021, the FTC’s new chair, Lina Khan, responded in a two-page letter that echoed the White House’s concerns and also expressed concern that the FTC’s “approach to merger review in recent years has enabled significant consolidation.” The letter claims that the FTC’s prior approach to retail fuel outlet mergers may have created “conditions ripe for price coordination and other collusive practices.”

New FTC Oil & Gas Initiatives

To address these concerns, the chair’s letter outlines several specific actions the agency plans to take.

First, the FTC will seek to “identify additional legal theories to challenge retail fuel station mergers where dominant players are buying up family-run businesses.” The letter does not provide any additional detail on this potentially significant shift in enforcement policy, the basis for this concern, or how this concern relates to protecting competition.

Second, the FTC will re-examine its approach to merger divestitures, to ensure that they do not encourage further consolidation or enable dominant firms or groups of firms to exercise market power. Khan states that she is “especially interested in ways that large national chains may ‘restore’ higher prices through collusive practices.” This reference to the industry-specific term of price “restorations” suggests that the agency’s leadership is more engaged than previously on the details of retail fuel station transactions.

Third, the FTC will “tak[e] steps to deter unlawful mergers in the oil and gas industry,” including by imposing “prior approval” requirements to deter companies from proposing “illegal mergers” in the first place. The FTC recently voted 3-2 to rescind its 1995 policy against the use of “prior approval” requirements in merger consent decrees.

Fourth, the FTC will ask staff to “investigate abuses in the franchise market,” with a specific focus on determining “whether the power imbalance favoring large national chains allows them to force their franchisees to sell gasoline at higher prices, benefitting the chain at the expense of the franchisee’s convenience store operations.” As with the first action item, how these concerns fit within the antitrust laws, and the basis for these concerns, are unclear at this point.

Expect Increased Scrutiny of M&A Activity

While the FTC regularly monitors oil and gasoline prices to identify unusual price activity that may signal potentially anticompetitive conduct in the industry and has brought numerous merger and non-merger enforcement actions over the years, oil and gas has not recently been a focus for the agency in public statements (unlike, for example, pharmaceuticals or technology companies). The letter suggests that the FTC leadership may be more focused on enforcement in the energy industry and that they may be particularly skeptical of transactions involving the acquisition of smaller local fuel retailers by larger national chains.

Based on our own recent experiences with oil and gas mergers before the FTC, and those of others in the antitrust bar, FTC staff has already begun requesting information from merging parties related to the issues in Chair Khan’s August 25 letter, as well as issues, such as unionization and ESG policies, of merging parties. Though Chair Khan’s letter focused on the retail gasoline level, we have seen similar expansive concerns at other levels of gasoline refining and production as well. These investigations are also taking longer than ever before. Unless the recent changes are a temporary blip on the radar — which the letter suggests is unlikely — large oil and gas companies and their counsel may need to adjust expectations on transaction timing and the range of issues investigated for matters that go before the FTC.

#### Health enforcement increased

Wetsman 9-22 [Nicole Wetsman, Health Tech Reporter at The Verge, “FTC Resurrects a Decade-Old Rule as a Guardrail on the Health App Explosion”, The Verge, 9/22/2021, https://www.theverge.com/2021/9/22/22688497/ftc-health-app-privacy-transparency-data]

Health apps have to tell their users about any data breaches or risk a hefty fine, the Federal Trade Commission clarified in a policy statement last week. The rule that requires that transparency is a decade old, but it hasn’t been enforced before. The new guidance serves as a warning to the many companies elbowing into the health app space: the FTC is taking issues around health data privacy seriously — even if it won’t be able to tackle all the privacy gaps on its own.

The FTC’s Health Breach Notification Rule covers all organizations that aren’t subject to the Health Insurance Portability and Accountability Act (HIPAA), which covers things like doctors and insurance companies. HIPAA requires those groups to disclose any time they have a data breach. The FTC rule covers any other group that deals in health information.

Health apps often haven’t had strong data privacy protections, FTC Chair Lina Khan said in a statement about the rule. Apps often have poor data protection systems, or violate their own privacy policies by sharing data with outside groups without telling users. These apps weren’t a piece of the digital health picture when the rule was first written. But since then, there’s been an explosion in health apps — tens of thousands are released each year, and downloads increased during the COVID-19 pandemic. More and more people are trusting their health information to these products. The new guidance clarifies that the Health Breach Notification Rule applies to these platforms as well, even if they didn’t think it covered them before.

The breaches that could trigger a report don’t just include hacks or attacks. These organizations would have to disclose any information shared without users’ permission. That might apply to situations like the recent privacy breach by period tracking app Flo, which was sharing data to Facebook, Google, and marketing companies without users’ knowledge. The FTC didn’t cite Flo for breaking the Health Breach Notification Rule — it focused on false statements made by the company about its privacy policies — but two FTC members argued that it should have.

The FTC’s new focus on making sure companies follow the rule could trigger internal changes at health apps, says David Simon, a research fellow at the Petrie-Flom Center for Health Law Policy, Biotechnology, and Bioethics at Harvard Law School. “It’s going to force them to at least put systems in place, if they’re not already in place, to figure out when these breaches occur and then notify people,” Simon says. The rule says that groups have to report any data breaches that they should have known about, not just that they do know about — so they have to have ways to monitor data.

The penalties for breaking the rule are fairly significant: $43,792 per violation per day. “That can add up very quickly,” says Jennifer Wagner, an assistant professor of law, policy, and engineering at Pennsylvania State University. “I think they’re trying to signal that, ‘look, it’s in your best interest if you’re an app developer or a vendor of a connected platform that you pay attention to this rule, and that you have some kind of response mechanism in place.’”

#### Tons of thumpers

Lyons 9-23 (Kim, Writer for the Verge, 9-23-2021 “New FTC memo calls for a focus on ‘structural dominance’ from big companies” The Verge <https://www.theverge.com/2021/9/23/22690176/ftc-chair-lina-khan-focus-antitrust-consumer-amazon> MSU-MJS)

In a memo to staff this week, FTC Chair Lina Khan outlined her new priorities for the agency: to focus on power imbalance, reduce harms to consumers, and address “rampant consolidation.” Khan wrote that the agency should focus its efforts and adjust its strategic approach to deal with the issues created by “next-generation technologies, innovations, and nascent industries across sectors.” And without mentioning Amazon, Apple, or Facebook by name, Khan’s list of priorities for the FTC signals that the tech giants are likely to face much closer scrutiny from the agency. First, Khan said, the FTC should take a “holistic” approach to how it considers antitrust violations, which can prove harmful to independent businesses and workers as well as consumers. “Business models that centralize control and profits while outsourcing risk, liability, and costs also warrant particular scrutiny, given that deeply asymmetric relationships between the controlling firm and dependent entities can be ripe for abuse,” Khan wrote. Khan wants the agency’s enforcement efforts focused on root causes of and incentives for unlawful conduct, such as “conflicts of interest, business models, or structural dominance.” The concept of structural dominance is a familiar theme for Khan. She wrote about it while she was a student at Yale Law School, in a now-famous paper where she argued that Amazon had managed to skirt monopoly laws to the point that its structural power gives it vast influence across the economy. In that paper, Khan also excoriated the way investors “are willing to fund predatory growth,” citing Uber as an example of a company whose investors braced to endure significant losses with the belief that they would one day recover their losses and then some. Khan’s memo this week echoes her earlier argument, calling out “the growing role of private equity and other investment vehicles” in ways that “may distort ordinary incentives” and fuel unfair competition. “Research documents how gatekeepers and dominant middlemen across the economy have been able to use their critical market position to hike fees, dictate terms, and protect and extend their market power,” she writes, adding that “deeply asymmetric relationships between the controlling firm and dependent entities can be ripe for abuse.” In addition, Khan wants to find ways for the FTC to strengthen its merger enforcement, “to address rampant consolidation and the dominance that it has enabled across markets,” and examine how contracts can perpetuate “unfair methods of competition or unfair or deceptive practices.” She also named noncompete agreements that can restrict workers from which jobs they can take, and right-to-repair restrictions as examples of unfair contracts. Apple in particular has been criticized for the way it limits how much users can repair Apple devices they own, and the FTC said earlier this year that it would fight such restrictions. “Consumers, workers, franchisees, and other market participants are at a significant disadvantage when they are unable to negotiate freely over terms and conditions,” Khan wrote in the memo.

#### They have eight top priorities now

1. Right-to-repair
2. IP Abuse
3. Monopoly offense
4. IDACO (Interlocking Directors And Common Ownership
5. Manipulation conduct
6. Bias in algorithms
7. Acts affecting armed forces members
8. Acts affecting children

Gehl et al 9-24 (Kate, Senior Counsel for Foley and Lardner LLP, Elizabeth A. N. Haas, Partner, Alan D. Rutenberg, Partner, H. Holden Brooks, Partner, Benjamin R. Dryden, Partner, Foley and Lardner LLP“A Divided FTC Approves Omnibus Resolutions to Step Up Enforcement Actions and Votes to Withdraw the 2020 Vertical Merger Guidelines” [https://www.foley.com/en/insights/publications/2021/09/divided-ftc-approves-omnibus-resolutions Published 9-24-2021](https://www.foley.com/en/insights/publications/2021/09/divided-ftc-approves-omnibus-resolutions%20Published%209-24-2021), MSU-MJS)

Last week saw two notable competition-related developments from the Federal Trade Commission (FTC). The first relates to the FTC’s approval of eight new compulsory process resolutions in high-priority areas. The second concerns the FTC’s withdrawal of its approval of the Vertical Merger Guidelines issued by the FTC and Department of Justice Antitrust Division in 2020. Compulsory Process Resolutions On September 14, 2021, the FTC voted 3-2 to approve new compulsory process resolutions in eight key enforcement areas with the goal of enabling more aggressive investigations of conduct in these areas. The eight new compulsory process resolutions concern: (1) repair restrictions, (2) abuses of intellectual property, (3) monopolization offenses, (4) interlocking directors & officers and common ownership, (5) deceptive and manipulative conduct on the internet, (6) bias in algorithms and biometrics, (7) acts or practices affecting United States Armed Forces Services members and veterans, and (8) acts or practices affecting children. The FTC uses the compulsory process as an investigatory tool through the issuance of demands for data, documents, and testimony via civil investigative demands (CIDs) or subpoenas. CIDs also permit the Commission to require recipients to file written reports or answer questions under oath. According to the FTC’s press release, the resolutions are aimed at broadening its ability “to obtain evidence in critical investigations on key areas where the FTC’s work can make the most impact.” The resolutions also will purportedly permit the FTC to “better utilize its limited resources” to quickly investigate potential misconduct. The FTC views the resolutions as one method to increase efficiency at the FTC, which certain Commissioners believe has become necessary due to the “increased volume of investigatory work” caused by a “surge” in merger filings in recent months. In practice, these resolutions allow a single Commissioner, instead of a majority of sitting Commissioners, to approve compulsory process requests in any investigation within the scope of the resolution for the next 10 years. What practical effect these resolutions will have remains to be seen; however, businesses engaged in conduct that may be implicated by the resolutions should be aware that FTC staff will now have an expedited ability to carry out compulsory process requests, which will very likely increase the number and scope of investigations conducted by the FTC. FTC Commissioners Noah Phillips and Christine Wilson voted against the resolutions, asserting that they do nothing to make investigations more effective and merely remove the FTC’s oversight of investigations, leaving room for reduced accountability as well as errors, overreach, excess costs, and decision making rooted in political motivations. Chair Lina Khan and Commissioner Rebecca Slaughter disagreed, emphasizing that the dissenting Commissioners overlook the fact that a subpoena must always receive Commissioner signoff, that Commissioners can and do receive briefings on the state of investigations, and that no enforcement action can move forward without majority support from the Commissioners. This publication highlights those areas impacted by the resolutions that are immediately relevant to antitrust policy and enforcement. Repair Restrictions: Repair restrictions have been a recent focus of the FTC (as well as the recent Biden Executive Order on Competition), so it is of little surprise that the FTC approved a resolution in this area to attempt to expedite impending investigations. This resolution looks to build on the FTC’s recent Policy Statement on Right to Repair. According to the FTC’s press release, the resolution will cover a wide swath of conduct, including facilitating the FTC staff’s impending investigation of violations of the Magnuson Moss Warranty Act’s anti-tying provisions, which prohibit warrantors from conditioning warranties on a consumer’s use of an article or service identified by brand, trade, or corporate name unless that article or service is provided without charge to the consumer. Abuse of Intellectual Property: With this resolution, which permits staff to investigate abuses of intellectual property rights, businesses in the pharmaceutical, technology, and gasoline refining industries can expect increased investigations surrounding their intellectual property practices given the FTC’s emphasis on those industries in its press release. That said, the resolution itself is broadly worded and could result in a spike in investigations in other industries where intellectual property rights are prevalent. Monopolistic Practices: This resolution seeks to build on the FTC’s recent focus on perceived market power abuses by technology companies and other large businesses. In particular, businesses in digital markets can expect increased investigatory activity given the FTC’s emphasis on these markets in its press release. However, the resolution is broad and will apply to any industry where the FTC perceives that market power abuses are likely. In their Joint Statement, Chair Khan and Commissioner Slaughter specifically highlighted that small businesses, franchisees, and startups routinely report that dominant firms abuse their market power and preclude the smaller firms from competing. As a result, increased investigations are likely in markets where franchisees or startups may be struggling to gain a foothold. Interlocking Directors & Officers and Common Ownership: This resolution is aimed at facilitating investigations of anticompetitive ownership stakes in competing companies, as well as interlocking directorates (e.g., where a person simultaneously serves as an officer or director of two competing corporations), which may violate Section 8 of the Clayton Act. In approving this resolution, the FTC emphasized that interlocking directorates and common ownership continue to raise significant competitive concerns and are likely to receive increased scrutiny as a result of this resolution.

### 1AR---Funding Solves

#### Reconciliation includes a massive boost to FTC funding

Koenig 11-4 [Bryan Koenig, Senior Competition Reporter at Law360, 11-4-2021 “FTC Fining Power, But Less Flexibility, In New House Budget” Lexis]

The massive budget package unveiled Wednesday also would give the FTC $500 million, available through September 2029, to set up a dedicated privacy bureau additionally responsible for "data security, identity theft, data abuses, and related matters." That amount is half the budget originally proposed in the earlier version of the bill, but the agency would also get another $500 million, available through September 2031, for antitrust enforcement.

#### FTC getting money now

Rich 11-2 [Jessica Rich, former director of the Federal Trade Commission’s (FTC) Bureau of Consumer Protection (BCP), Of Counsel at Kelly Drye, 11-2-2021 https://www.adlawaccess.com/2021/11/articles/a-new-era-for-the-ftc-and-u-s-privacy-house-reconciliation-bill-would-give-the-ftc-500-million-to-build-a-new-privacy-bureau/]

As we’ve all been following in the news, the House reconciliation bill to fund “human infrastructure” is still mired in negotiations, ever on the verge of either passing to monumental fanfare, or cratering in failure. Tucked away on page 671 of the 1684-page bill is a short provision that, despite scant attention, has the potential to usher in a new era for the FTC and U.S. privacy – $500 million to fund a brand new FTC privacy bureau, to be spent between 2022 and 2029. Here’s what the provision says:

FEDERAL TRADE COMMISSION FUNDING FOR A PRIVACY BUREAU AND RELATED EXPENSES. In addition to amounts otherwise available, there is appropriated for fiscal year 2022, out of any money in the Treasury not otherwise appropriated, $500,000,000, to remain available until September 30, 2029, to the Federal Trade Commission to create and operate a bureau, including by hiring and retaining technologists, user experience designers, and other experts as the Commission considers appropriate, to accomplish its work related to unfair or deceptive acts or practices relating to privacy, data security, identity theft, data abuses, and related matters.

With all of the talk about trillions here and billions there for infrastructure, $500 million might sound like chump change. But to put it in perspective, the FTC’s current annual budget is about $350 million – covering all of its programs, including its entire antitrust mission and the many components of consumer protection, of which privacy is just one. Further, the FTC currently employs just 61 people to staff its privacy mission, at a cost of about $13 million – less than 1/38th of the proposed new $500 million budget (or about 1/5 on an annual basis, when the amount is spread over its eight-year duration). Indeed, when one of us called for the creation of a new FTC privacy bureau last March, it seemed inconceivable that such a bureau could launch with a half-billion-dollar wind at its sails.

With $500 million, the FTC could employ hundreds of additional staff – including lawyers, investigators, technologists, and other experts – to oversee U.S. privacy. It could bring (and litigate) “big cases” (and smaller ones too), study key industries, conduct consumer surveys, provide more personalized assistance to U.S. consumers, and provide greater leadership and guidance (through public events and user-friendly publications) here and abroad. (And yes, the FTC could also launch rulemakings to expand existing rules, or to launch new ones under its inherent Magnuson-Moss rulemaking authority.) For those who have been calling for a brand new U.S. privacy agency, this new, well-funded privacy bureau could go a long way to satisfying their goals.

Of course, what this legislation would not do is strengthen the FTC’s legal authority by (among other things) enacting a comprehensive federal privacy law, giving the FTC full jurisdiction over common carriers and nonprofits, and authorizing monetary remedies for privacy violations. For years, the FTC and others have argued that these types of legal reforms are necessary to ensure that the agency can be fully effective in protecting consumers’ privacy.

Nevertheless, if the legislation passes, businesses should expect more oversight in the form of investigations, litigation, warning letters, studies, surveys, and rulemakings. Indeed, the FTC has already highlighted some of these goals and aspirations in early October, which we discussed in an October 3 blogpost on the topic. With $500 million, the FTC’s “wish list” list would grow exponentially longer and could include, for example, enforcement “sweeps” to examine companies’ privacy practices, even in the absence of any suspicion of wrongdoing. We are following this issue closely and will post additional details as they unfold.

#### It’s a game-changer for FTC enforcement

Romm 21 [Tony Romm is the congressional economic policy reporter at The Washington Post 9-9-2021 https://www.washingtonpost.com/us-policy/2021/09/09/democrats-tech-reconciliation/]

One of the top federal agencies overseeing Apple, Facebook, Google and other Silicon Valley tech giants could see a boost to its budget as part of congressional Democrats’ sprawling $3.5 trillion economic package.

The proposal, unveiled by a panel of House Democrats on Thursday, would set aside $1 billion for the Federal Trade Commission to create a new digital-focused division that would police privacy violations, cybersecurity incidents and other online abuses.

The new spending could represent a roughly 30 percent increase in the commission’s total projected appropriations over the next decade — money that could add more legal firepower to an agency whose resources are badly outmatched by many of the companies it regulates.

#### An unprecedented increase in funding and capacity

ANA 21 [Association of National Advertisers, 9-20-2021 https://www.ana.net/blogs/show/id/rr-blog-2021-09-A-Billion-Dollar-FTC]

The House Energy and Commerce Committee, as part of the reconciliation process, last week proposed a massive change to the Federal Trade Commission (FTC) by approving the creation of a vast new FTC bureau dedicated to privacy, data security, and identity theft regulation. The Committee also authorized one billion dollars, in addition to existing funding, to support the activities of this new bureau.

These are truly unprecedented actions. Since the creation of the FTC one hundred seven years ago, there has never been a proposed expansion of manpower or funding that approaches this magnitude. This initiative has been taken without any specific hearings on this proposal or any effort to identify with any specificity how this extraordinary infusion of funding and other resources will be utilized. The proposal also completely fails to do anything to affect the growing number of inconsistent privacy laws in the states that increasingly threaten to impose major costs, disruption, and confusion on the Internet marketplace.