# 1AC---Texas

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### 1AC---Innovation

#### Advantage One is 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

### 1AC---Plan

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

### 1AC---Federalism

#### Advantage Two is 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

#### Effective regulations solve extinction

Matus 14 [Kira Matus, PhD, Havard University. Associate Head and Associate Professor, Division of Public Policy, Hong Kong University of Science and Technology. "Existential risk: challenges for risk regulation." Risk and Regulation (Winter 2014). https://futureoflife.org/data/documents/Existential%20Risk%20Resources%20(2015-08-24).pdf?x93895]

There is a trend in many areas towards attention to ‘big’ risks. Financial regulation has become increasingly concerned with so‐called systemic risks. Others, and not just Hollywood blockbusters, have been attracted to the study of civilization‐destroying catastrophic risks. Indeed, the OECD has become increasingly interested in ‘high level’ risks and ways in which different national governments seek to prepare for and manage actual events, such as the aftermath of major earthquakes, or the response to a terrorist attack. The notion of ‘existential’ risk might be adding to the cacophony of emerging ‘big’ risk concerns. However, existential risk deserves special attention as it fundamentally adds to our understanding of particular types of risks, and it also challenges common wisdom regarding actions designed to support continued survival.

What is existential risk? We can approach this question by looking at several attributes. The first attribute is what, in fact, is at risk. One set of existential risks are those that threaten survival. These are the acute catastrophes, i.e. the idea that particular events’ impacts are likely to extinguish civilization. Such risks have been identified when it comes to asteroids, nuclear war, and other largescale events that undermine the possibility for survival in general, or, at least, in large regions. A second set is based on the idea that existential risks are not just about physical survival, but about the survival of ways of life. In other words, certain risks are seen as threatening established ways of doing things, cultures, social relationships, and understandings of the ‘good life’. There is, of course, much disagreement about what the good life constitutes, and therefore there will always be disagreement as to what exactly an existential risk constitutes.

A second attribute is the degree to which an existential risk is triggered by a single catastrophic incident. Existential risks arise not merely from one‐off large incidents, such as earthquakes, tsunamis, nuclear meltdowns or, indeed, asteroid hits. Rather, existential risks are about complex, inter‐related processes that result in cascading effects that move across social systems. The overall impact of these system changes could result in the types of physical or cultural destruction that is the focus of the first two perspectives.

Whether triggered by catastrophic events or complex cascades, standard operating procedures are unlikely to be sufficient for dealing with existential risks; instead, this is a space in which improvisation and creativity are required. A third attribute of existential risks is the challenge they present to standard approaches to risk regulation. Existential risks are defined by their cross‐systematic nature; a failure within one system (say, finance) has not just catastrophic implications for the sector in question, but threatens the survival of another system (say, the environment, as funding for particular measures dries up). In other words, the focus of existential risks is not just on the systemic level, it focuses on the cross‐ systemic dimension that is even more difficult to predict and assess than attempts aimed at establishing activities that are of ‘systemic’ relevance by regulatory systems that tend to be narrowly focused and independent from each other. Existential risks are characterized by a fourth feature, namely the idea that existential risks lead to responses based upon fear. Individuals are confronted with fears about their survival (death) and about the meaning of their lives. This aspect of existential risk is particularly troublesome in an age of low trust in authority and, consequently, a political style that is intolerant of ‘blame free’ spaces. In the absence of confidence in public authority, few options remain. For some, the solution will rely on framework plans, pop intellectuals and other fashionable ideas that seem to offer redemption from the fear of extinction. Others will prefer to ‘go it alone’ and seek to develop their own plans for survival, noting that risk taking is, after all, an individual choice. Others, again, will deny the legitimacy of public authority and veer towards those choices that have been legitimized by their own communities. Finally, some will deny that existential risks exist in the first place. In other words, individual responses to existential risks vary considerably and pose challenges for any risk management and communication strategy.

#### 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]

#### Unregulated nanotech risks extinction.

Behreandt 22 (Dennis Behreandt, MA from St. Norbert’s College, BA from Ripon College, cites Luis Del Monte, Award-winning physicist, author of *Nanoweapons: A Growing Threat to Humanity*, CEO of Del Monte & Associates, Inc.,; “Nanotechnology: A Double-Edged Sword;” 01-31-22, The New American, Vol. 38, No. 02, <https://thenewamerican.com/nanotechnology-a-double-edged-sword/>, TM) [language modified, denoted by brackets]

“Gray goo” is not a current threat, and likely won’t be, at least for the near-term future. More likely is that nanotech innovations could be used for evil purposes. “Unfortunately, as with nuclear technology, it is far easier to create destructive uses for nanotechnology than constructive ones,” wrote famed computing pioneer and Sun Microsystems co-founder Bill Joy in a now-famous essay for Wired magazine in April 2000. In that essay, titled “Why the Future Doesn’t Need Us,” Joy wrote, “Nanotechnology has clear military and terrorist uses, and you [can] ~~need not be suicidal to~~ release a massively destructive nanotechnological device — such devices can be built to be selectively destructive, affecting, for example, only a certain geographical area or a group of people who are genetically distinct.”

Scientists and researchers concerned with “existential risks” continue to point to nanotechnology as one innovation that poses distinctly significant threats to the survival of human civilization.

Physicist and author Luis Del Monte, who reports he was previously “a Honeywell Executive Director,” states that during his career “he led hundreds of physicists, engineers, and technology professionals engaged in micro to nanotechnology development for the Department of Defense (DoD) and commercial applications.” In 2017 he authored the book Nanoweapons: A Growing Threat to Humanity.

According to Del Monte, the first “singularity” of the sort envisioned by Ray Kurzweil — when general AI exceeds human cognitive capabilities — will lead to a second singularity involving self-replicating nanobots. Writing for HuffPost in 2017, Del Monte argued, “Given the strong symbiotic relationship between computer power and nanotechnology, we may see both technologies progressing faster than their historical trends. My rationale is that an advance in one technology fosters advances in the other.” He continued, “I judge this synergy may accelerate the advancement of both technologies.”

On his own website, Del Monte described what he foresaw as the outcome of the development of self-replicating nanobots. His vision differs from Drexler’s gray goo (which Drexler in recent years has backed away from a bit), but is likely more realistic.

“Self-replicating nanobots are the ultimate invention,” Del Monte said, pointing out that they would help solve problems on one hand, while proving extremely dangerous on the other. “In medicine,” he pointed out, “they will flow through our blood preventing diseases and curing injuries. In military applications, they will have the capability to completely destroy an adversary, from its populace to its structures.”

Unfortunately, he noted, nanobots could escape control, presenting considerable risks as artificial analogues to biological microbes such as bacteria and viruses. More complex biological systems, including mammals such as humans, have developed sophisticated immune systems in parallel with the existence of biological pathogens, and thus have an innate ability to protect themselves — if not always successfully — from them. There would be no such protection from artificial microbes — nanobots — if they escaped control.

Enter the extra-factual: In Total Recall, the blockbuster film adaptation of the Philip K. Dick short story We Can Remember It for You Wholesale, a future technology was used to implant realistic memories into the human mind. With nanotechnologies such as those being explored by several DARPA-funded labs, such a future might not be far off.

“Strategic nanoweapons, like their nuclear counterparts, pose a threat to humanity,” Del Monte argues. “The major issue is control. Will we be able to deploy strategic nanoweapons and maintain control over them? If, for example, we lost control of self-replicating nanobots, we would face a technological plague, one that we currently have no way of stopping.”

Nanotechnology is used widely today in many diverse applications, and continuing research promises near-term future innovation resulting in outcomes likely to be similar to forecasts from early innovators and researchers in the technology. Tied directly to AI and enabled by advanced 5G communications technologies, nanotechnologies are both a boon and a danger to mankind. While they will allow fabulous advances — especially in medicine and in materials science — they also have direct application to reality-distorting and reality-obliterating outcomes such as the metaverse plan outlined by Facebook.

#### Unregulated AI risks extinction---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.

#### Scenario 2 is Nuclear Security:

#### Emerging tech regulatory experimentation is vital to nuclear security – new tech simultaneously increases and decreases the risk – only effective regulation solves

Roth 21 [Nickolas Roth is director of the Stimson Center’s Nuclear Security Program and International Nuclear Security Forum, Master of Public Policy from the University of Maryland, 10-5-2021 https://www.stimson.org/2021/a-multilevel-approach-to-addressing-emerging-technologies-in-nuclear-security/]

Risks and opportunities

Emerging technologies present a range of unique risks and opportunities for the security of radiological and nuclear materials, both from operational and institutional points of view. In some cases, technologies that mature and become more easily accessible to adversaries can close capability gaps that would otherwise prevent material theft or sabotage. Others have the potential to strengthen physical protection capabilities, but only after development, implementation and integration into existing plans and procedures. Because the potential impacts of these technological developments are not yet fully understood, they must compete for resources and attention with more immediate and well-defined priorities.

The most immediately apparent risk is that of technological surprise: a novel application of an emerging technology that presents a threat to radiological and nuclear R/N material security that planners and regulators fail to anticipate, suddenly leaving material vulnerable to theft or sabotage and operators without a way to address it. For example, recent attacks using Unmanned Aerial Systems (UAS) such recent attacks against oil processing facilities in Saudi Arabia demonstrate the vulnerability of even well-defended targets against a new adversary capability for which they lack effective countermeasures.3 4 Technological surprise is an ever- present risk in emerging technologies because they often result from the convergence of multiple lines of technical development into an application whose effectiveness may not become apparent until used by an adversary.

Another related risk that emerging technologies present is the introduction of new vulnerabilities as emerging technologies are adopted at various points in R/N material production, storage and use. Technologies that enable increased digitalization, connectivity and automation can improve the efficiency of nuclear power plants, but they also underscore the challenge that new attack surfaces represent. Although there have been no known successful cyberattacks that successfully compromised the operational controls of nuclear power plants, malware and software malfunctions have previously rendered key monitoring systems inaccessible5 and infected internal networks at nuclear plants.6 Other cyberattacks against non- nuclear infrastructure, such as the May 2021 ransomware attack against Colonial Pipeline’s billing system, demonstrate that attackers need not access operational technology systems to severely impact operations.7

The risk of missed opportunities to harness positive effects of emerging technologies remains an important one for the R/N security mission space, particularly because of safety and security concerns and implementation procedures that may inhibit technology adoption and integration into physical protection systems (PPS) or other security infrastructure. Longstanding challenges to R/N security, such as the effect of cognitive stress and fatigue on security personnel,8 insider threats,9 and the challenge of providing realistic training for low-frequency security events, may lessen as emerging technologies provide more potential solutions, but only if those solutions are identified and implemented effectively. Similarly, opportunities to use UAS in security applications are growing along with the technology’s capabilities,10 but the pace and scope of adoption will ultimately determine the impact of this development on global R/N security. Failure to apply these innovations to nuclear security will leave material at unnecessary risk.

#### Single terrorist use is likely and even a crude device kills a million people, causes nuc war and collapses the international order

Bunn 17 [Matthew Bunn is a professor of practice at the Harvard Kennedy School. A former advisor in the White House Office of Science and Technology Policy 9-28-2017 https://thebulletin.org/2017/09/the-effects-of-a-single-terrorist-nuclear-bomb/]

The escalating threats between North Korea and the United States make it easy to forget the “nuclear nightmare,” as former US Secretary of Defense William J. Perry put it, that could result even from the use of just a single terrorist nuclear bomb in the heart of a major city.

At the risk of repeating the vast literature on the tragedies of Hiroshima and Nagasaki—and the substantial literature surrounding nuclear tests and simulations since then—we attempt to spell out here the likely consequences of the explosion of a single terrorist nuclear bomb on a major city, and its subsequent ripple effects on the rest of the planet. Depending on where and when it was detonated, the blast, fire, initial radiation, and long-term radioactive fallout from such a bomb could leave the heart of a major city a smoldering radioactive ruin, killing tens or hundreds of thousands of people and wounding hundreds of thousands more. Vast areas would have to be evacuated and might be uninhabitable for years. Economic, political, and social aftershocks would ripple throughout the world. A single terrorist nuclear bomb would change history. The country attacked—and the world—would never be the same.

The idea of terrorists accomplishing such a thing is, unfortunately, not out of the question; it is far easier to make a crude, unsafe, unreliable nuclear explosive that might fit in the back of a truck than it is to make a safe, reliable weapon of known yield that can be delivered by missile or combat aircraft. Numerous government studies have concluded that it is plausible that a sophisticated terrorist group could make a crude bomb if they got the needed nuclear material. And in the last quarter century, there have been some 20 seizures of stolen, weapons-usable nuclear material, and at least two terrorist groups have made significant efforts to acquire nuclear bombs.

Terrorist use of an actual nuclear bomb is a low-probability event—but the immensity of the consequences means that even a small chance is enough to justify an intensive effort to reduce the risk. Fortunately, since the early 1990s, countries around the world have significantly reduced the danger—but it remains very real, and there is more to do to ensure this nightmare never becomes reality.

Brighter than a thousand suns. Imagine a crude terrorist nuclear bomb—containing a chunk of highly enriched uranium just under the size of a regulation bowling ball, or a much smaller chunk of plutonium—suddenly detonating inside a delivery van parked in the heart of a major city. Such a terrorist bomb would release as much as 10 kilotons of explosive energy, or the equivalent of 10,000 tons of conventional explosives, a volume of explosives large enough to fill all the cars of a mile-long train. In a millionth of a second, all of that energy would be released inside that small ball of nuclear material, creating temperatures and pressures as high as those at the center of the sun. That furious energy would explode outward, releasing its energy in three main ways: a powerful blast wave; intense heat; and deadly radiation.

The ball would expand almost instantly into a fireball the width of four football fields, incinerating essentially everything and everyone within. The heated fireball would rise, sucking in air from below and expanding above, creating the mushroom cloud that has become the symbol of the terror of the nuclear age. The ionized plasma in the fireball would create a localized electromagnetic pulse more powerful than lightning, shorting out communications and electronics nearby—though most would be destroyed by the bomb’s other effects in any case. (Estimates of heat, blast, and radiation effects in this article are drawn primarily from Alex Wellerstein’s “Nukemap,” which itself comes from declassified US government data, such as the 660-page government textbook The Effects of Nuclear Weapons.)

At the instant of its detonation, the bomb would also release an intense burst of gamma and neutron radiation which would be lethal for nearly everyone directly exposed within about two-thirds of a mile from the center of the blast. (Those who happened to be shielded by being inside, or having buildings between them and the bomb, would be partly protected—in some cases, reducing their doses by ten times or more.)

The nuclear flash from the heat of the fireball would radiate in both visible light and the infrared; it would be “brighter than a thousand suns,” in the words of the title of a book describing the development of nuclear weapons—adapting a phrase from the Hindu epic the Bhagavad-Gita. Anyone who looked directly at the blast would be blinded. The heat from the fireball would ignite fires and horribly burn everyone exposed outside at distances of nearly a mile away. (In the Nagasaki Atomic Bomb Museum, visitors gaze in horror at the bones of a human hand embedded in glass melted by the bomb.)

No one has burned a city on that scale in the decades since World War II, so it is difficult to predict the full extent of the fire damage that would occur from the explosion of a nuclear bomb in one of today’s cities. Modern glass, steel, and concrete buildings would presumably be less flammable than the wood-and-rice-paper housing of Hiroshima or Nagasaki in the 1940s—but many questions remain, including exactly how thousands of broken gas lines might contribute to fire damage (as they did in Dresden during World War II). On 9/11, the buildings of the World Trade Center proved to be much more vulnerable to fire damage than had been expected. Ultimately, even a crude terrorist nuclear bomb would carry the possibility that the countless fires touched off by the explosion would coalesce into a devastating firestorm, as occurred at Hiroshima. In a firestorm, the rising column of hot air from the massive fire sucks in the air from all around, creating hurricane-force winds; everything flammable and everything alive within the firestorm would be consumed. The fires and the dust from the blast would make it extremely difficult for either rescuers or survivors to see.

The explosion would create a powerful blast wave rushing out in every direction. For more than a quarter-mile all around the blast, the pulse of pressure would be over 20 pounds per square inch above atmospheric pressure (known as “overpressure”), destroying or severely damaging even sturdy buildings. The combination of blast, heat, and radiation would kill virtually everyone in this zone. The blast would be accompanied by winds of many hundreds of miles per hour.

The damage from the explosion would extend far beyond this inner zone of almost total death. Out to more than half a mile, the blast would be strong enough to collapse most residential buildings and create a serious danger that office buildings would topple over, killing those inside and those in the path of the rubble. (On the other hand, the office towers of a modern city would tend to block the blast wave in some areas, providing partial protection from the blast, as well as from the heat and radiation.) In that zone, almost anything made of wood would be destroyed: Roofs would cave in, windows would shatter, gas lines would rupture. Telephone poles, street lamps, and utility lines would be severely damaged. Many roads would be blocked by mountains of wreckage. In this zone, many people would be killed or injured in building collapses, or trapped under the rubble; many more would be burned, blinded, or injured by flying debris. In many cases, their charred skin would become ragged and fall off in sheets.

The effects of the detonation would act in deadly synergy. The smashed materials of buildings broken by the blast would be far easier for the fires to ignite than intact structures. The effects of radiation would make it far more difficult for burned and injured people to recover. The combination of burns, radiation, and physical injuries would cause far more death and suffering than any one of them would alone.

The silent killer. The bomb’s immediate effects would be followed by a slow, lingering killer: radioactive fallout. A bomb detonated at ground level would dig a huge crater, hurling tons of earth and debris thousands of feet into the sky. Sucked into the rising fireball, these particles would mix with the radioactive remainders of the bomb, and over the next few hours or days, the debris would rain down for miles downwind. Depending on weather and wind patterns, the fallout could actually be deadlier and make a far larger area unusable than the blast itself. Acute radiation sickness from the initial radiation pulse and the fallout would likely affect tens of thousands of people. Depending on the dose, they might suffer from vomiting, watery diarrhea, fever, sores, loss of hair, and bone marrow depletion. Some would survive; some would die within days; some would take months to die. Cancer rates among the survivors would rise. Women would be more vulnerable than men—children and infants especially so.

Much of the radiation from a nuclear blast is short-lived; radiation levels even a few days after the blast would be far below those in the first hours. For those not killed or terribly wounded by the initial explosion, the best advice would be to take shelter in a basement for at least several days. But many would be too terrified to stay. Thousands of panic-stricken people might receive deadly doses of radiation as they fled from their homes. Some of the radiation will be longer-lived; areas most severely affected would have to be abandoned for many years after the attack. The combination of radioactive fallout and the devastation of nearly all life-sustaining infrastructure over a vast area would mean that hundreds of thousands of people would have to evacuate.

Ambulances to nowhere. The explosion would also destroy much of the city’s ability to respond. Hospitals would be leveled, doctors and nurses killed and wounded, ambulances destroyed. (In Hiroshima, 42 of 45 hospitals were destroyed or severely damaged, and 270 of 300 doctors were killed.) Resources that survived outside the zone of destruction would be utterly overwhelmed. Hospitals have no ability to cope with tens or hundreds of thousands of terribly burned and injured people all at once; the United States, for example, has 1,760 burn beds in hospitals nationwide, of which a third are available on any given day.

And the problem would not be limited to hospitals; firefighters, for example, would have little ability to cope with thousands of fires raging out of control at once. Fire stations and equipment would be destroyed in the affected area, and firemen killed, along with police and other emergency responders. Some of the first responders may become casualties themselves, from radioactive fallout, fire, and collapsing buildings. Over much of the affected area, communications would be destroyed, by both the physical effects and the electromagnetic pulse from the explosion.

Better preparation for such a disaster could save thousands of lives—but ultimately, there is no way any city can genuinely be prepared for a catastrophe on such a historic scale, occurring in a flash, with zero warning. Rescue and recovery attempts would be impeded by the destruction of most of the needed personnel and equipment, and by fire, debris, radiation, fear, lack of communications, and the immense scale of the disaster. The US military and the national guard could provide critically important capabilities—but federal plans assume that “no significant federal response” would be available for 24-to-72 hours. Many of those burned and injured would wait in vain for help, food, or water, perhaps for days.

The scale of death and suffering. How many would die in such an event, and how many would be terribly wounded, would depend on where and when the bomb was detonated, what the weather conditions were at the time, how successful the response was in helping the wounded survivors, and more. Many estimates of casualties are based on census data, which reflect where people sleep at night; if the attack occurred in the middle of a workday, the numbers of people crowded into the office towers at the heart of many modern cities would be far higher. The daytime population of Manhattan, for example, is roughly twice its nighttime population; in Midtown on a typical workday, there are an estimated 980,000 people per square mile. A 10-kiloton weapon detonated there might well kill half a million people—not counting those who might die of radiation sickness from the fallout. (These effects were analyzed in great detail in the Rand Corporation’s Considering the Effects of a Catastrophic Terrorist Attack and the British Medical Journal’s “Nuclear terrorism.”)

On a typical day, the wind would blow the fallout north, seriously contaminating virtually all of Manhattan above Gramercy Park; people living as far away as Stamford, Connecticut would likely have to evacuate.

Seriously injured survivors would greatly outnumber the dead, their suffering magnified by the complete inadequacy of available help. The psychological and social effects—overwhelming sadness, depression, post-traumatic stress disorder, myriad forms of anxiety—would be profound and long-lasting.

The scenario we have been describing is a groundburst. An airburst—such as might occur, for example, if terrorists put their bomb in a small aircraft they had purchased or rented—would extend the blast and fire effects over a wider area, killing and injuring even larger numbers of people immediately. But an airburst would not have the same lingering effects from fallout as a groundburst, because the rock and dirt would not be sucked up into the fireball and contaminated. The 10-kiloton blast we have been discussing is likely toward the high end of what terrorists could plausibly achieve with a crude, improvised bomb, but even a 1-kiloton blast would be a catastrophic event, having a deadly radius between one-third and one-half that of a 10-kiloton blast.

These hundreds of thousands of people would not be mere statistics, but countless individual stories of loss—parents, children, entire families; all religions; rich and poor alike—killed or horribly mutilated. Human suffering and tragedy on this scale does not have to be imagined; it can be remembered through the stories of the survivors of the US atomic bombings of Hiroshima and Nagasaki, the only times in history when nuclear weapons have been used intentionally against human beings. The pain and suffering caused by those bombings are almost beyond human comprehension; the eloquent testimony of the Hibakusha—the survivors who passed through the atomic fire—should stand as an eternal reminder of the need to prevent nuclear weapons from ever being used in anger again.

Global economic disaster. The economic impact of such an attack would be enormous. The effects would reverberate for so far and so long that they are difficult to estimate in all their complexity. Hundreds of thousands of people would be too injured or sick to work for weeks or months. Hundreds of thousands more would evacuate to locations far from their jobs. Many places of employment would have to be abandoned because of the radioactive fallout. Insurance companies would reel under the losses; but at the same time, many insurance policies exclude the effects of nuclear attacks—an item insurers considered beyond their ability to cover—so the owners of thousands of buildings would not have the insurance payments needed to cover the cost of fixing them, thousands of companies would go bankrupt, and banks would be left holding an immense number of mortgages that would never be repaid.

Consumer and investor confidence would likely be dramatically affected, as worried people slowed their spending. Enormous new homeland security and military investments would be very likely. If the bomb had come in a shipping container, the targeted country—and possibly others—might stop all containers from entering until it could devise a system for ensuring they could never again be used for such a purpose, throwing a wrench into the gears of global trade for an extended period. (And this might well occur even if a shipping container had not been the means of delivery.)

Even the far smaller 9/11 attacks are estimated to have caused economic aftershocks costing almost $1 trillion even excluding the multi-trillion-dollar costs of the wars that ensued. The cost of a terrorist nuclear attack in a major city would likely be many times higher.

The most severe effects would be local, but the effects of trade disruptions, reduced economic activity, and more would reverberate around the world. Consequently, while some countries may feel that nuclear terrorism is only a concern for the countries most likely to be targeted—such as the United States—in reality it is a threat to everyone, everywhere. In 2005, then-UN Secretary-General Kofi Annan warned that these global effects would push “tens of millions of people into dire poverty,” creating “a second death toll throughout the developing world.” One recent estimate suggested that a nuclear attack in an urban area would cause a global recession, cutting global Gross Domestic Product by some two percent, and pushing an additional 30 million people in the developing world into extreme poverty.

Desperate dilemmas. In short, an act of nuclear terrorism could rip the heart out of a major city, and cause ripple effects throughout the world. The government of the country attacked would face desperate decisions: How to help the city attacked? How to prevent further attacks? How to respond or retaliate?

Terrorists—either those who committed the attack or others—would probably claim they had more bombs already hidden in other cities (whether they did or not), and threaten to detonate them unless their demands were met. The fear that this might be true could lead people to flee major cities in a large-scale, uncontrolled evacuation. There is very little ability to support the population of major cities in the surrounding countryside. The potential for widespread havoc and economic chaos is very real.

If the detonation took place in the capital of the nation attacked, much of the government might be destroyed. A bomb in Washington, D.C., for example, might kill the President, the Vice President, and many of the members of Congress and the Supreme Court. (Having some plausible national leader survive is a key reason why one cabinet member is always elsewhere on the night of the State of the Union address.) Elaborate, classified plans for “continuity of government” have already been drawn up in a number of countries, but the potential for chaos and confusion—if almost all of a country’s top leaders were killed—would still be enormous. Who, for example, could address the public on what the government would do, and what the public should do, to respond? Could anyone honestly assure the public there would be no further attacks? If they did, who would believe them? In the United States, given the practical impossibility of passing major legislation with Congress in ruins and most of its members dead or seriously injured, some have argued for passing legislation in advance giving the government emergency powers to act—and creating procedures, for example, for legitimately replacing most of the House of Representatives. But to date, no such legislative preparations have been made.

In what would inevitably be a desperate effort to prevent further attacks, traditional standards of civil liberties might be jettisoned, at least for a time—particularly when people realized that the fuel for the bomb that had done such damage would easily have fit in a suitcase. Old rules limiting search and surveillance could be among the first to go. The government might well impose martial law as it sought to control the situation, hunt for the perpetrators, and find any additional weapons or nuclear materials they might have. Even the far smaller attacks of 9/11 saw the US government authorizing torture of prisoners and mass electronic surveillance.

And what standards of international order and law would still hold sway? The country attacked might well lash out militarily at whatever countries it thought might bear a portion of responsibility. (A terrifying description of the kinds of discussions that might occur appeared in Brian Jenkins’ book, Will Terrorists Go Nuclear?) With the nuclear threshold already crossed in this scenario—at least by terrorists—it is conceivable that some of the resulting conflicts might escalate to nuclear use. International politics could become more brutish and violent, with powerful states taking unilateral action, by force if necessary, in an effort to ensure their security. After 9/11, the United States led the invasions of two sovereign nations, in wars that have since cost hundreds of thousands of lives and trillions of dollars, while plunging a region into chaos. Would the reaction after a far more devastating nuclear attack be any less?

In particular, the idea that each state can decide for itself how much security to provide for nuclear weapons and their essential ingredients would likely be seen as totally unacceptable following such an attack. Powerful states would likely demand that others surrender their nuclear material or accept foreign troops (or other imposed security measures) to guard it.

That could well be the first step toward a more profound transformation of the international system. After such a catastrophe, major powers may feel compelled to more freely engage in preventive war, seizing territories they worry might otherwise be terrorist safe havens, and taking other steps they see as brutal but necessary to preserve their security. For this reason, foreign policy analyst Stephen Krasner has argued that “conventional rules of sovereignty would be abandoned overnight.” Confidence in both the national security institutions of the country attacked and international institutions such as the International Atomic Energy Agency and the United Nations, which had so manifestly failed to prevent the devastation, might erode. The effect on nuclear weapons policies is hard to predict: One can imagine new nuclear terror driving a new push for nuclear disarmament, but one could also imagine states feeling more certain than ever before that they needed nuclear weapons.

#### Nuclear security vital to stop cyber and physical attacks on reactor cores

Van Dine 16 [A. Van Dine, Nuclear Threat Initiative, Washington, D.C., United States of America 12-17-2016 https://www.nti.org/media/documents/IAEA\_Conf\_2016\_Outpacing\_Cyber\_Threats\_Van\_Dine.pdf?\_=1481058428?\_=1481058428]

Ensuring the security of nuclear facilities is a critical element in preventing theft of nuclear materials and sabotage that could result in a radiological release. While the international community has traditionally focused on improving physical security to prevent these outcomes by investing in the “guns, guards, and gates” trifecta, a newer threat has gained attention: the cyber threat. A cyber-attack perpetrated by a terrorist group on a nuclear facility could have physical consequences leading to either an act of theft or sabotage. This threat presents new challenges to facility operators as well as national authorities. Given the increasing reliance upon digital controls, it is expected that these challenges will only continue to grow.

A security lapse at a nuclear facility leading to theft of nuclear material or a catastrophic radiological release would have global implications—an incident anywhere would have consequences everywhere, and would cast doubt on industry-wide security practices. Therefore, all countries must have effective cybersecurity measures in place. Currently, government authorities and facility operators are struggling to keep pace with this new threat, battling issues such as high costs, bureaucratic inertia, highly complex systems, cultures of compliance, and a shortage of demonstrably qualified personnel. National and international guidance has evolved over the past year, but not quickly enough to address the growing gap between attacker and defender capabilities in cyberspace.

Recognizing that the growing sophistication of cyber threats increasingly taxes the capabilities of governments, national regulators, and facility operators around the world, the Nuclear Threat Initiative (NTI) has concluded that a fresh look at the overarching framework that guides cybersecurity implementation at nuclear facilities is an urgent, necessary precursor to achieving essential progress in this area. Despite valuable ongoing efforts at the national and international level, more must be done. A more effective and perhaps disruptive approach, based on a set of high-level priorities, is critical to getting ahead of this threat.

#### Core meltdown causes extinction

Lendman 11 [Stephen Lendman. BA from Harvard University. Two years of US Army service followed, then an MBA from the Wharton School at the University of Pennsylvania. Syndicated journalist riting on major world and national issues The People’s Voice: News and Viewpoints. “Nuclear meltdown in Japan,” March 13th, 2011. http://www.thepeoplesvoice.org/TPV3/Voices.php/2011/03/13/nuclear-meltdown-in-japan

For years, Helen Caldicott warned it's coming. In her 1978 book, "Nuclear Madness," she said: "As a physician, I contend that nuclear technology threatens life on our planet with extinction. If present trends continue, the air we breathe, the food we eat, and the water we drink will soon be contaminated with enough radioactive pollutants to pose a potential health hazard far greater than any plague humanity has ever experienced." More below on the inevitable dangers from commercial nuclear power proliferation, besides added military ones. On March 11, New York Times writer Martin Fackler headlined, "Powerful Quake and Tsunami Devastate Northern Japan," saying: "The 8.9-magnitude earthquake (Japan's strongest ever) set off a devastating tsunami that sent walls of water (six meters high) washing over coastal cities in the north." According to Japan's Meteorological Survey, it was 9.0. The Sendai port city and other areas experienced heavy damage. "Thousands of homes were destroyed, many roads were impassable, trains and buses (stopped) running, and power and cellphones remained down. On Saturday morning, the JR rail company" reported three trains missing. Many passengers are unaccounted for. Striking at 2:46PM Tokyo time, it caused vast destruction, shook city skyscrapers, buckled highways, ignited fires, terrified millions, annihilated areas near Sendai, possibly killed thousands, and caused a nuclear meltdown, its potential catastrophic effects far exceeding quake and tsunami devastation, almost minor by comparison under a worst case scenario. On March 12, Times writer Matthew Wald headlined, "Explosion Seen at Damaged Japan Nuclear Plant," saying: "Japanese officials (ordered evacuations) for people living near two nuclear power plants whose cooling systems broke down," releasing radioactive material, perhaps in far greater amounts than reported. NHK television and Jiji said the 40-year old Fukushima plant's outer structure housing the reactor "appeared to have blown off, which could suggest the containment building had already been breached." Japan's nuclear regulating agency said radioactive levels inside were 1,000 times above normal. Reuters said the 1995 Kobe quake caused $100 billion in damage, up to then the most costly ever natural disaster. This time, from quake and tsunami damage alone, that figure will be dwarfed. Moreover, under a worst case core meltdown, all bets are off as the entire region and beyond will be threatened with permanent contamination, making the most affected areas unsafe to live in. On March 12, Stratfor Global Intelligence issued a "Red Alert: Nuclear Meltdown at Quake-Damaged Japanese Plant," saying: Fukushima Daiichi "nuclear power plant in Okuma, Japan, appears to have caused a reactor meltdown." Stratfor downplayed its seriousness, adding that such an event "does not necessarily mean a nuclear disaster," that already may have happened - the ultimate nightmare short of nuclear winter. According to Stratfor, "(A)s long as the reactor core, which is specifically designed to contain high levels of heat, pressure and radiation, remains intact, the melted fuel can be dealt with. If the (core's) breached but the containment facility built around (it) remains intact, the melted fuel can be....entombed within specialized concrete" as at Chernobyl in 1986. In fact, that disaster killed nearly one million people worldwide from nuclear radiation exposure. In their book titled, "Chernobyl: Consequences of the Catastrophe for People and the Environment," Alexey Yablokov, Vassily Nesterenko and Alexey Nesterenko said: "For the past 23 years, it has been clear that there is a danger greater than nuclear weapons concealed within nuclear power. Emissions from this one reactor exceeded a hundred-fold the radioactive contamination of the bombs dropped on Hiroshima and Nagasaki." "No citizen of any country can be assured that he or she can be protected from radioactive contamination. One nuclear reactor can pollute half the globe. Chernobyl fallout covers the entire Northern Hemisphere." Stratfor explained that if Fukushima's floor cracked, "it is highly likely that the melting fuel will burn through (its) containment system and enter the ground. This has never happened before," at least not reported. If now occurring, "containment goes from being merely dangerous, time consuming and expensive to nearly impossible," making the quake, aftershocks, and tsunamis seem mild by comparison. Potentially, millions of lives will be jeopardized. Japanese officials said Fukushima's reactor container wasn't breached. Stratfor and others said it was, making the potential calamity far worse than reported. Japan's Nuclear and Industrial Safety Agency (NISA) said the explosion at Fukushima's Saiichi No. 1 facility could only have been caused by a core meltdown. In fact, 3 or more reactors are affected or at risk. Events are fluid and developing, but remain very serious. The possibility of an extreme catastrophe can't be discounted. Moreover, independent nuclear safety analyst John Large told Al Jazeera that by venting radioactive steam from the inner reactor to the outer dome, a reaction may have occurred, causing the explosion. "When I look at the size of the explosion," he said, "it is my opinion that there could be a very large leak (because) fuel continues to generate heat." Already, Fukushima way exceeds Three Mile Island that experienced a partial core meltdown in Unit 2. Finally it was brought under control, but coverup and denial concealed full details until much later. According to anti-nuclear activist Harvey Wasserman, Japan's quake fallout may cause nuclear disaster, saying: "This is a very serious situation. If the cooling system fails (apparently it has at two or more plants), the super-heated radioactive fuel rods will melt, and (if so) you could conceivably have an explosion," that, in fact, occurred. As a result, massive radiation releases may follow, impacting the entire region. "It could be, literally, an apocalyptic event. The reactor could blow." If so, Russia, China, Korea and most parts of Western Asia will be affected. Many thousands will die, potentially millions under a worse case scenario, including far outside East Asia.

#### 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.

#### Enforcement high now and thumps links

Ingrassia 1-4 [John Ingrassia, Proskauer Rose LLP, 1-4-2022 https://www.law360.com/articles/1452119/how-to-navigate-the-coming-antitrust-policy-tests]

2021 will be remembered in antitrust law. Not since the 1970s has there been so much chatter over the fundamental purposes of antitrust policy, or such potential for actual sea change.

Half a century ago, Robert Bork and the Chicago School argued that antitrust law had lost its way and should focus on consumer welfare. Bork's view was that antitrust enforcement was getting in the way of legitimate competition, and the U.S. Supreme Court was quick to embrace the consumer welfare standard.

Now, Federal Trade Commission Chair Lina Khan and the new Brandeisians argue that antitrust law has again lost its way and must shed the constraints of the consumer welfare standard.

Khan's view is that consolidation has gone unchecked in the American economy, resulting in structural harms to competition that the consumer welfare standard is unable to address.

She believes the agency has historically defined markets too narrowly to effectively police broader economic impacts of sustained consolidation, and favored gerrymandered remedies over outright challenges.

Khan has imposed sweeping changes aimed at chilling merger activity and shaping the future of merger enforcement. Against dissents from Republican Commissioners Christine Wilson and Noah Phillips, and charge of going rogue from the U.S. Chamber of Commerce, the FTC stripped away long-standing exemptions and interpretations that streamlined merger review.

The action came in response to an unprecedented merger wave — 3,845 acquisitions filed with the agencies in the first 11 months of 2021, substantially more than most full years.

The changes are having an impact, making investigations more intrusive, lengthy and less predictable. Still, policy precedes practice, and while the FTC has been heavy on policy, it has yet to test those policies in the courts.

The tests may come in the next year. Meanwhile, we can also expect the FTC and the U.S. Department of Justice under Assistant Attorney General Jonathan Kanter's leadership, to not only continue the trajectory of policy changes but also begin the task of entrenching them in agency practice.

Here, we review the year in FTC policy moves, what they mean and how to navigate the newly laid minefields.

Warning Letters After the Close of HSR Waiting Periods

In an unprecedented move, the FTC recently began issuing letters to parties in transactions the agency may intend to investigate after expiration of the Hart-Scott-Rodino Act waiting period. According to the agency in an Aug. 3, 2021, blog, this is the result of "a tidal wave of merger filings that is straining the agency's capacity to rigorously investigate deals ahead of the statutory deadlines." Wilson, however, said on Twitter on Aug. 12, 2021, that she was "gravely concerned that the carefully crafted HSR framework is suffering a death by a thousand cuts," following her Aug. 9 statement that said "For the HSR Act to retain meaning, it cannot be that the FTC will keep merger investigations open indefinitely, as a matter of routine, every time there is a surge in filings." The FTC's jurisdiction to review transactions is independent of the HSR reporting requirements, with the power to investigate any transaction before or after closing, whether subject to reporting or not, and whether the HSR waiting period has expired or not. There are examples of the agencies reviewing nonreportable transactions, and even investigating reportable transactions after expiration of the HSR waiting period, though they are rare. The warning letters do not assert new authority not already existing under law, but notifying parties that an investigation may remain open post-HSR clearance implicates finality and certainty of investigations, but not every transaction gets a warning letter. Those with no issues go through unscathed. Those with clear issues are investigated. The deals that might pose some issues, but not enough to draw an investigation, might trigger the newly minted warning letter. To show the letters have teeth, the FTC will sooner or later have to challenge a deal post-HSR waiting period, putting it to the test before courts, where it is likely to face hurdles to the extent the deal did not warrant a full investigation in the first instance. Still, the practice is ushering a change in how provisions are drafted in deal documents. A buyer asserting that it is not required to close over the — arguably — still-pending investigation may face an uphill battle depending on how the closing conditions are drafted, for they typically point to the expiration of applicable waiting periods and not the absence of potential ongoing investigations or issuance of warning letters. So careful buyers seek closing requirements that no investigations are threatened and that no warning letters have been issued. Recent examples include the 3D Systems Corp.'s agreement to acquire Oqton Inc. and Universal Corp.'s agreement to buy Shank's Extracts Inc. The parties' agreements provided that if a warning letter is issued, the investigation would be treated as closed 30 days after receipt of such letter. Buyers may want to consider similar provisions until more emerges on how the FTC will proceed with warning letter transactions.

More Intensive Merger Investigations

The FTC announced plans on Aug. 3, 2021, to make the second request process both "more streamlined and more rigorous." The changes include the following: Merger investigations will address additional potentially impacted competition, such as labor markets, cross-market effects, and the impact on incentives of investment firms. Modifications to second requests will be more limited. The agency will require parties to provide more information relating to their use of e- discovery in responding to the investigation. Additional information will be required with respect to privilege claims. The FTC said these changes are in recognition that "an unduly narrow approach to merger review may have created blind spots and enabled unlawful consolidation." Possibly in response to such steeped up investigative techniques and resistance to find common ground with merger parties, Sportsman's Warehouse Holdings Inc. and Great Outdoors Group LLC abandoned their proposed merger at the end of 2021, citing indications that the FTC would be unlikely to approve the outdoor sporting goods transaction. The changes, though, do little to streamline the second request process. They make it more complex, burdensome and time-consuming. Perhaps most notable is the use of the process to delve into labor markets. Republicans Wilson and Phillips argued that FTC leadership may have themselves to blame for the merger review crunch, saying in a Nov. 8, 2021 statement: If the agency is lowering thresholds of concern and broadening theories of harm, this certainly would explain why the FTC is unable to conduct merger reviews in a timely manner while our sister agency remains capable of addressing the same increased filing volumes within statutory timeframes.

More Onerous Consent Decree Provisions

Where merger parties settle a challenge rather than litigate, the consent decree process sets out the parties' obligations. Historically, such consent decrees, among other things, required parties to notify the agency prior to certain future acquisitions. The FTC rescinded this long-standing policy, noting that it: Returns now to its prior practice of routinely requiring merging parties subject to a Commission order to obtain prior approval from the FTC before closing any future transaction affecting each relevant market for which a violation was alleged. The agency will also require divestiture buyers to agree to prior approval for any future sale of the assets they acquire. Khan explained the move was to avoid "drain[ing] the already strapped resources of the Commission" on "repeat offenders." The FTC included the new provision in its Oct. 25, 2021, consent decree settling a proposed transaction by DaVita Inc., a dialysis service provider. DaVita is now required to receive prior approval from the FTC of 10 years before any new acquisitions, a dialysis clinic business in Utah being in question. This is a significant change and will chill not only settlements with the FTC, but also M&A transactions at the outset where such provisions are commercially untenable. Wilson and Phillips noted in dissent that "a prior approval requirement imposes significant obligations on merging parties and innocent divestiture buyers." The FTC clearly aims to chill M&A activity, and merger agreements that provide more optionality to abandon deals will become more common, though parties intent on pushing their deal through may see a consent decree with 10-year approval provisions as less palatable than litigating, and force the FTC to cave or go to court.

Withdrawal of the Vertical Merger Guidelines

In another party-line vote, the FTC withdrew the vertical merger guidelines, which were issued just last year. Democratic commissioners criticized the guidelines as based on "unsound economic theories that are unsupported by the law or market realities," and reflecting a "flawed discussion of the purported procompetitive benefits (i.e., efficiencies) of vertical mergers." Vertical transactions are between firms at different levels in the supply chain. Historically, antitrust enforcement of exceptional vertical mergers were rare and difficult given the previously presumed efficiencies. Vertical mergers can eliminate double marginalization, in which firms at each level mark up prices above marginal cost. Elimination of one markup results in lower prices and can be pro-competitive. Khan, however, argues the guidelines' "reliance on [elimination of double marginalization] is theoretically and factually misplaced." Going forward, "the FTC will analyze mergers in accordance with its statutory mandate, which does not presume efficiencies for any category of mergers." This too drew a strong rebuke from the Republican commissioners, who said "The FTC leadership continues the disturbing trend of pulling the rug out under from honest businesses and the lawyers who advise them." The commission's challenges to chipmaker Nvidia Corp.'s $40 billion acquisition of U.K. chip design provider Arm Ltd. alleged the transaction would combine one of the largest chip producers with a firm that has essential design technology — critical inputs. In a Dec. 2, 2021, statement, the FTC said the acquisition "would distort Arm's incentives in chip markets and allow the combined firm to unfairly undermine Nvidia's rivals." The FTC's lawsuit should "send a strong signal that we will act aggressively to protect our critical infrastructure markets from illegal vertical mergers that have far-reaching and damaging effects on future innovations," FTC Bureau of Competition Director Holly Vedova said in the statement. Given that vertical mergers will be closely scrutinized as a matter of course, parties need to consider concerns the FTC may identify and prepare strong counters — other than elimination of double marginalization. For example, parties could argue that the transaction expands access to products and expands consumer choice. Parties willing to go the distance with a vertical merger should also remain mindful that the guidelines have never been cited or relied on by a court, and it is the established jurisprudence on vertical transactions that will carry the day.

Rescinding the Consumer Welfare Standard

In July 2021, the FTC rescinded its policy interpreting its statutory mandate to root out "unfair methods of competition" as coterminous with promoting consumer welfare under the Sherman and Clayton Acts. In a July 19, 2021, statement, the FTC called the rescinded policy was "bind[ing] the FTC to liability standards created by generalist judges in private treble-damages actions under the Sherman Act." Still, the consumer welfare standard has been entrenched in antitrust jurisprudence for decades, and the FTC cannot change that. The immediate impact is thus more likely to be seen in administrative actions in the FTC's own court. In a dissenting statement, Republican commissioners countered that FTC leadership does not propose a replacement standard and "that efforts to distance Section 5 from the consumer welfare standard are a recipe for bad policy and adverse court decisions," adding that, "unlike those in academia, the FTC will have to defend its interpretation of Section 5 in court, where it should expect a hostile reception if it cannot offer clear limiting principles."

Labor Market Scrutiny

Government investigations and private litigation relating to no-poach and wage-fixing agreements are ballooning, and criminal indictments are now a reality. Encouraged by President Joe Biden's executive order on competition, the FTC and the DOJ have doubled down on investigating labor markets. Merger investigations now routinely include requests for employee compensation data, inquiries regarding noncompete and nonsolicit agreements, and are more likely to delve into both the merger's effects on labor, and the parties' prior labor practices. The DOJ's challenge to Penguin Random House LLC's proposed acquisition of Simon & Schuster Inc. focuses on harm to the labor market — for authors. In his first public comments, the DOJ's Kanter said: We will fight for American workers including in connection with illegal mergers that substantially lessen competition for laborers. Going forward, you can expect efforts like these not only to continue but to increase. Khan echoed the sentiment, saying: Competition and conduct can hurt us not just as consumers who buy products from a shrinking number of large firms, but also as workers who are especially vulnerable and subject to the whims of a boss we can't equally or practically escape. Antitrust compliance policies now must extend to addressing practices with respect to employee recruiting and compensation. Antitrust compliance training must extend beyond the sales team, and include HR. Businesses are reviewing and revising their compliance policies, and beginning new antitrust training programs to ensure that they are not subjected to claims of depressed wages and barriers to worker mobility.

Looking Ahead to the Year to Come

The year 2021 has been like no other for antitrust enforcement. While the FTC's various policy pronouncements are clearly intended to chill merger activity, it does not appear to have had the intended outcome.

HSR filings continue at off-the-charts levels. Amid this strong showing of M&A activity, the advice is to keep moving transactions forward, stay ahead of the new tacks the agencies might take, and account for newly injected risk and uncertainty.

Looking ahead, expect another energetic year. So far, the FTC's policy changes have not seemed to slow the pace of merger activity, but the frenzy cannot last forever. Nonetheless, merging parties are now going into the merger review process with eyes open, knowing it is likely to be more intense and uncertain. Parties to vertical transactions will no longer ride easy on double marginalization theories, and parties will be handing over their HR and payroll files.

At the same time, the heavy resistance to these changes will continue, if not strengthen, and will play out not just in courts and the halls of Congress, but will also spill into the political mainstream.

The U.S. Chamber of Commerce is planning to spend hundreds of thousands of dollars on an ad campaign across 10 states denouncing what it calls the FTC's overstepping of regulatory authority.

#### 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.

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### Private Sector – 2AC

#### Parker immunity shields private entities in anticompetitive behavior – it’s not only when state is acting as sovereign

Safvati 16 [Sina Safvati, J.D., University of California, Los Angeles, School of Law, with honors, 2016 B.A., University of California, Los Angeles, summa cum laude, 2012 CLERKSHIPS U.S.C.A., 9th Circuit U.S.D.C., Southern District of Florida, https://www.uclalawreview.org/wp-content/uploads/2019/09/Safvati-63-4-update.pdf]

Based in part on the fear that States might “confer antitrust immunity on private persons by fiat,”24 the Supreme Court clarified in later decisions that the automatic exemption from federal antitrust law applies only when the state is acting as a sovereign—when the anticompetitive decision is expressly made by a state legislature or state supreme court.25 In the case of political subdivisions and private entities, the Parker immunity exemption applies only if the entity makes a sufficient showing that the anticompetitive decision was in fact one of the sovereign.26 Through its subsequent jurisprudence, the Court defined three distinct categories in the Parker-immunity inquiry.

The first category is reserved for cases in which the sovereign directly and expressly made the anticompetitive action, limited to actions of the state legislature or state supreme court.27 Parker immunity automatically applies in such cases.28 The second category (“quasi-public”)29 is reserved for cases in which a municipality or a “prototypical state agency”30 has engaged in anticompetitive conduct.31 When municipalities seek Parker immunity, the anticompetitive conduct must have been pursuant to a clearly articulated state policy to displace competition.32 The third category is reserved for instances in which private entities have engaged in anticompetitive conduct. When private entities seek Parker state-action immunity, they must show both that the challenged conduct was pursuant to a clearly articulated state policy and that it was actively supervised by the state itself.33 In the 2014–2015 term, the Supreme Court held in North Carolina Board of Dental Examiners v. FTC that a state occupational licensing board comprised of a “controlling number” of “active market participants” was private and subject to the active supervision requirement.34

[Footnote 33] E.g., Cal. Retail Liquor Dealers Ass’n v. Midcal Aluminum, Inc., 445 U.S. 97, 105–06 (1980) (holding that the private wine price-setting scheme could not benefit from Parker immunity because although the scheme was pursuant to a clearly articulated state policy, the state did not engage in any “pointed reexamination” of the program and thus did not satisfy the active state supervision prong); see also S. Motor Carriers Rate Conference, Inc. v. United States, 471 U.S. 48, 56–57 (1985).

#### Private sector is not “controlled” by state

**JTP 21** (Java T Point, https://www.javatpoint.com/public-sector-vs-private-sector)

The **public sector** is the sector which includes both **public companies** and **services**. In other words, the public sector is the sector that is under government's control. The public sector includes agencies, enterprises, banks, companies, etc., that are controlled by the government. Some examples of the public sector include infrastructure, sewers, public transit, healthcare, goods, services, etc. The public sector is made of three parts, i.e., the judiciary, legislative, and executive. These three segments combine and make the private sector. One of the major aims of the public sector is to have a balance between economy and wealth. The public sector is under the state control. More or less, the companies and agencies under the public sector are owned by the state. Now, let us look at some contrasting points between these sectors.

Private Sector

The private sector is defined as the **sector** wherein the **economy** is controlled by **private groups**. In layman's terms, a **private sector** is the sector that is **not under the control of the state**. Private sectors are run by companies yielding profits. The private sector can also be called as the citizen sector. Examples of the private sector are ICICI Bank, ITC Limited, HDFC Bank, etc. Apart from the banks, the proprietors, businessmen, accountants, SMEs, etc., are some other examples of the private sector. The major objective of the private sector is to earn maximum profits and have sole ownership or control. The private banks have better management systems, due to which they are able to yield more profits. Some of the private companies include Vitol, Koch Industries, Huawei, etc.

## Buddhism

### 2AC

#### Perm do both – Antirust K all wrong. Reductionist *and* rejects tools that curtail violence.

* … post-dating oddly matters bc past examples don’t assume how the Aff/Khan might deploy anti-trust.
* … more than link D – Alt forgoes workable option to re-shape the very power they criticize.
* Author = uber-qual’d… peer-reviewed cultural theory journal recent lit..

Paul ‘22

Sanjukta Paul - Assistant Professor of Law, Romano Stancroff Research Scholar, Wayne State University - J.D., Yale Law School - From the article: “A Democratic Vision for Antitrust” - From the Journal – Dissent - Published by University of Pennsylvania Press - Volume 69, Number 1, Winter 2022, pp. 56-62 (Article) – modified for language that may offend - available via Project Muse

Last spring, prominent Big Tech critic Lina Khan became the new chair of the Federal Trade Commission (FTC)—an appointment widely ~~seen as~~ (considered) a coup for progressive reform. In her confirmation hearing, she characterized the agency’s overarching goal in terms of “fair competition.” This choice of emphasis is significant for understanding the antitrust reform project of which Khan is a leader. At its core, the project is a policy paradigm aimed at creating fair markets—markets characterized by socially beneficial competition, fair prices, and decent wages.

While both proponents and detractors of this reform project sometimes conflate competition policy with the goal of maximizing economic competition for its own sake, in reality, competition law has always assessed economic rivalry and coordination in relation to broader social ends. For a long time, that assessment has been obscured—not to mention insufficiently tethered to the original goals of federal antitrust law. The reform project aims to reorient the use of antitrust in expressly egalitarian and democratic directions.

For decades, competition law and policy have been dominated by the neoclassical law and economics paradigm, which claims that visible market design and coordination interfere with competitive dynamics that would otherwise lead to an efficient allocation of social resources, and thus to the maximization of social welfare. While recent shifts in mainstream economic thinking have led to more discussion of imperfect competition, particularly in labor markets, the “market failures” and power imbalances that justify interventions are on this view still essentially special cases. Moreover, this idealized picture of markets still obscures certain forms of background coordination—especially the often hierarchical and extractive coordination that happens within business firms—while treating other coordination mechanisms as exceptional, with the potential to distort ideal market outcomes.

Conventionally organized business firms are just one of the many means we have to coordinate economic activity; others include labor unions, producers’ cooperatives, and public price boards, to take just a few examples. Because competition law makes ground-up decisions about many forms of economic coordination, and influences the regulatory stance toward others, antitrust reforms hold the potential to affect a broad set of economic policies.

We should not act as if putatively neutral, technocratic appeals to idealized competition can replace moral and political choices about economic life. Nor, however, should we treat actual competition as inherently tainted by its association with neoclassical theory. Channeled appropriately, competition is healthy rivalry: it encourages technological and operational innovations that can have broad social benefits, and it represents an important check on arbitrary bureaucratic power by preserving outside options for workers, consumers, and businesses. Channeled inappropriately, competition can lead to the destructive undermining of rivals (in contrast to constructive outperformance), overwhelm socially valuable independent enterprises, and destroy existing market settlements characterized by fair prices and decent wages. There is no universal logic of competition for policymakers to apply, either dark or redemptive: it is legal, social, and political choices (almost) all the way down.

To move from principles to some specifics, we can ~~look at~~ (consider) the approach the reform project might take in three policy areas: policing corporate mergers and acquisitions, accommodating horizontal and bottom-up economic coordination, and re-regulating the law of vertical restraints. *These* reforms, which are mutually reinforcing, all have the power to help build a more equal and democratic legal organization of the economy.

#### Institutional action to reduce suffering is compassionate and ethical---this requires evaluating consequences and acting despite uncertainty

Ford 9 – Dr. Christopher Ford, D.Phil from Oxford University, JD from Yale Law School, Rhodes Scholar, BA from Harvard University, Former Senior Fellow at the Hudson Institute, “Nukes and the Vow: Security Strategy as Peacework”, July, https://www.upaya.org/uploads/pdfs/NukesandtheVowfinal.pdf

It is relatively easy to vow to save all sentient beings; it is much harder to figure out how best to do it. Engaged Buddhism – that rich field of action in the world that devotes itself to the alleviation of suffering by trying to address unhealthy patterns and structures in human social life – aims beyond merely the transformation of individual hearts. It aspires also to systemic transformation. This inescapably entangles it, however, with quite conventional issues of public policy.

The compassionate imperative of the Bodhisattva’s vow to save all sentient beings is certainly clear enough for any Mahayana practitioner interested in engaged practice, but the vow is notably unspecific about policy details. This is how it must be, however, for as it is said in the Four Vows, creations are numberless and delusions are indeed inexhaustible. Consequently, numberless too are the “skillful means” (upaya) that may be needed to overcome delusion.

In traditional Buddhist iconography, Avalokiteshvara – the Bodhisattva of Compassion, the archetype of the enlightened being committed to bringing all others to salvation – is for this reason sometimes depicted with a thousand arms, each with its own tool. So varied are the forms of suffering in the world, the message seems to be, that only thus equipped could anyone hope to alleviate it. Any insight into the fundamentally transitory nature of things in the samsaric world suggests that no simple or invariant specific recipe would long retain relevance anyway. In other words, the many-handed bodhisattva will have to switch tools frequently.

So of course the Vow does not provide us with useful details! It shouldn’t. In any kind of fixed form, such details would not be useful for long, nor for all the “targets” of compassionate action anyway. Such codification, in fact, might well delude us still further by encouraging unhealthy fixation where in fact we need improvisational flexibility. Genuinely compassionate action is necessarily rooted in an open-minded not knowing. Fixed and rigid answers are not skillful means.

Nevertheless, the vow provides our moral compass, the mountaintop toward which we strive. It is then up to us – in all our inadequacy, and in the face of the hugeness of the task – to navigate through the forests and ravines that lie between us and that peak. It is our responsibility to figure out what our commitment to alleviating suffering means as applied to our particular circumstances. Since we lack Avalokiteshvara’s endless supply of helping hands and useful tools, and because we ourselves may suffer from all manner of samsaric delusions, we must acknowledge that our efforts will frequently fall short or go awry. Where the Vow meets the complexity and contingency of the world, there may be no transcendentally or permanently “right” answer, and even the best informed and well-intentioned actions today may have sweepingly contrary consequences tomorrow. We cannot know with utter certainty.

Buddhism thus does not dictate policy as much as it dictates where our hearts must lie in working on public policy issues. The Bodhisattva Vow tells us why these things matter, but while compassion offers a yardstick for trying to evaluate the available options and develop new ones, we fall into delusion and attachment if we presume that Buddhism confers upon us infallibility or dictates every specific policy outcome. Certainty is the “near-enemy” – the dark shadow side – of insight. If we know that our position is wholly right and that those who disagree are wholly wrong, we are part of the problem.

Yet, this should not be a call to despair, a message of futility, or an amoral relativism bred in a sense of indeterminacy so seemingly profound that no intelligible course of action can be chosen at all. The very contingency and unpredictability of the world – which makes illusions of our pretenses to prediction and certitude – actually counsels hope: it may yet be that in the volatile soup of public affairs, even our faltering, incomplete, and confused interventions will yield transformative results. Nor does insight into the fundamental unknowability of outcomes necessarily mean that every path is as good as the next one. Not knowing need not be the same thing as having no bearings; we can yet aspire sometimes to glimpse that one path probably is better than another.

In any event, the Vow leaves engaged Buddhists with no alternative but to try to alleviate suffering. In doing so, we must acknowledge and embrace all this not knowing, while grounding our efforts for change in as deep a wellspring of compassion and clarity as we can. And we should hold our specific policy convictions lightly enough that we do not damage real insight and clarity on the sharp edges of their seeming certainties, even as we grasp the compassionate grounding of social action with all our strength.

This is the perspective that I try to bring to Buddhist peacework in the area of nuclear disarmament. It is essential, I feel, to begin from the perspective that the overriding objective is to create a world that contains as little human suffering as possible. Whatever else it might mean for a Mahayana Buddhist to seek, through social action, to create conditions maximally conducive to the enlightenment of other sentient beings, it presumably includes working to ensure a relatively stable global security environment. To put it rather bloodlessly, people who are being slaughtered probably face significant constraints upon their capacity for spiritual practice.

You will notice, however, that I did not begin from the presupposition that it should be a fundamental goal of Buddhist peacework to eliminate nuclear weapons. Many Buddhist peaceworkers seem to believe this, but to my eye it puts the cart before the horse. The compassionate objective is to prevent or alleviate suffering as Buddhists understand this term: we seek a future world structured so as to offer ever better opportunities for humans to overcome samsaric confusion and attachment. If it could be shown conclusively that the existence of nuclear weapons inherently inhibits spiritual progress – and that a world containing such weapons is intrinsically more enlightenmentinhibiting than any imaginable world without them – then a good Buddhist would surely have to be their implacable foe. This, however, is probably not the case. The world of 2009 is a dangerous and troublesome one in many respects, but I myself would not trade it for 1914 or 1942.

One foreign diplomat friend of mine likes to joke, at least privately, that the disarmament movement needs to be careful lest it “make the world safe again for largescale conventional war.” He is only partly joking, however. From the perspective of Buddhist compassion, some global security environments without nuclear weapons are surely less desirable than some scenarios that contain them. We must do what we can to avoid offering cures more harmful than the disease we seek to treat, and while it is notoriously difficult to predict outcomes – one way or the other – in the complex adaptive system of modern international politics, we are no friends of compassion if we do not at least worry about the potential unintended consequences of our policy agendas.

We cannot, therefore, be absolutists, nor “theologize” disarmament. We must remember that peace and security is the public policy objective, not nuclear disarmament per se. Weapons elimination is just one possible upaya, to be used or discarded depending upon its contribution to the goal. To treat it as an axiom that no stable and enlightenment-facilitating future world could possibly contain any nuclear weapons seems to me a form of delusive knowing. I am no more willing simply to assume the necessity of eliminating such weapons than I am to assume the imperative of keeping them. From the vantage point of genuine compassion, details matter.

#### Inner serenity depends upon external peace, which requires political engagement to create minimal conditions of security

Ford 10 – Dr. Christopher Ford, D.Phil from Oxford University, JD from Yale Law School, Rhodes Scholar, BA from Harvard University, Former Senior Fellow at the Hudson Institute, “Action and Force in Engaged Buddhism: Public Policy and the Koan of Engagement”, Dissertation Submitted in Partial Satisfaction of Requirements for Chaplaincy Ordination at the Prajna Mountain Order of Soto Zen Buddhism, 2-1, p. 23-25

On the other hand, some authors do at least hint at the type of answer Engaged Buddhism must provide if it is to defend itself as a specifically Buddhist variety of activism addressed to suffering as Buddhists understand the term. Kenneth Kraft, for example, has suggested that “inner serenity is fostered or impeded by external conditions.”104 He has not, however, spelled out the critical details that any such theory would have to provide in order for Engaged Buddhists to be able to articulate an intelligible plan for social action. Despite his prioritization of internal work, Thich Nhat Hanh has also articulated a clear call for creating conditions favorable to other beings’ enlightenment: in order for individuals to recover from the mental sicknesses of the world and be whole, he says, they must be in “an environment favorable to healing.” Analogizing spiritual progress to psychiatric treatment, he declares that health “requires environmental change and psychiatrists must participate in efforts to change the environment.”105 Sulak Sivaraksa has also suggested that engagement is necessary to improve the conditions of samsara because “[w]ithout freedom from want and oppression, people cannot be expected to appreciate more sublime forms of personal liberation.”106 This is genuine insight, but more is needed: such vague generalities are still a thin reed upon which to hang a serious public policy agenda.

David Loy has attempted to provide a specifically Buddhist theory of social engagement – a full-blown “Buddhist Social Theory” – in some detail. For each type of dukkha described in the Pali suttas, for instance, he tries to articulate what this category would mean as applied in the social sphere: he asks whether it has a specifically “communal” manifestation. He suggests, for instance, that dukkha-dukkhata corresponds in the social realm, in part, to things such as the gap between rich and poor, or the “deteriorating biosphere.” 107 This translation from individual to social, he thinks, is what helps give him the conceptual traction to articulate a political agenda of engagement, prescribing specific policies and structures suited to addressing this form of suffering. Unfortunately, however, Loy’s ambitious articulation of “social” suffering still fails to provide a clear theory of connection and redress – an account of what circumstances in the samsaric world promote enlightenment and which ones impede it, and of how social activism can help increase the frequency of the former compared to the latter. As we will see, Loy has much to say about what specific policies he believes Buddhists should promote in their activism to change the circumstances of samsara. He does not, however, always clearly or compellingly ground such recommendations in a theory of why such steps contribute to ending suffering in the very specific sense that Buddhists use the term.

This is not to say that such a theory is impossible. Quite the contrary. Such writers would seem to be right to intuit that there exists a rationale for social “engagement” in an appreciation for the fact that – notwithstanding Buddhism’s understanding that suffering arises not from conditions themselves but from how we relate to them through the delusive attachments of the ego-self – there exists some nexus between the circumstances of the samsaric world and the likelihood of sentient beings being able to achieve enlightenment. Circumstances may not be the fundamental causes of suffering, this argument might run, but neither are they entirely irrelevant to its alleviation. As Tashi Tsering reminds us, while the Dalai Lama has noted that our external surroundings can only cause us limited disturbance if we maintain a calm and peaceful mind, “His Holiness does not say that once we have a calm mind, we will never be disturbed by external things. His Holiness presents a more realistic view.”108 Engaged Buddhists, one might argue, are realistic as well.

*Some* circumstances, in other words, are likely to be more conducive than others to sentient beings’ progress toward awakening, and it is the job of Engaged Buddhists to bring about more (rather than less) enlightenment-facilitating circumstances out of the messy raw materials of samsara. A Buddhist social theory might not care about changing samsaric circumstances per se, but it should care about worldly conditions to the extent that they create an environment more or less conducive to the enlightenment of the sentient beings therein. Buddhist social engagement, therefore, should be about creating ever more enlightenment-facilitating conditions. In Jones’ words, “[t]he social order to which Buddhist social action is ultimately directed must be one that … offers encouraging conditions for its citizens to see more clearly into their true nature and overcome their karmic inheritance.” 109

A Buddhist politics, therefore, would presumably focus upon developing theories about how to do this, and policies designed to achieve this end of creating enlightenmentconducive circumstances. Such work inescapably involves us in the classically political and policy-focused tasks of finding levers with which to manipulate the conditions of the modern world.

Some policy agendas might seem to flow relatively easily from this insight. As we have seen with the example of the Buddha’s decision to abandon his harsh asceticism because hunger and weakness prevented proper dharma practice, it may be possible to conclude that there exists at least a minimum set of concrete circumstances that are necessary to permit the kind of spiritual endeavor needed for Awakening. If so, a Buddhist social policy would presumably devote itself to helping ensure that members of the public did not fall below this “floor” of practice-impeding absolute penury, wracking illness, civil chaos, or wartime bloodshed. Nelson Foster has suggested that the prevention of nuclear warfare is an easy case for a Buddhist policy priority, wryly quoting the slogan of one group within the Buddhist Peace Fellowship that “[n]uclear war is bad for our practice.”110

## CIL

### Court CP – CIL NB – 2AC

#### Squo gradual incorporation solves but formal obligation fails

Bradley 16 [Curtis A. Bradley, William Van Alstyne Professor, Duke Law School, 2016 http://www.californialawreview.org/wp-content/uploads/2016/12/7-Bradley.pdf]

In his informative and timely book, Justice Breyer repeatedly emphasizes that the Supreme Court is a domestic court, not an international tribunal, and that there is no Supreme Court for the world.1 Against that backdrop, Justice Breyer suggests various functions that the Supreme Court can perform as it faces an increasingly international docket, such as promoting harmonization, fostering collaboration, and helping to promote the rule of law. I do not disagree that the Supreme Court can play these roles in appropriate cases. In this Essay, I will describe another important role that the Supreme Court does and should serve, which is to act as a filter between international law and the American constitutional system. Although not Justice Breyer’s focus, this filtering role is illustrated by a number of the cases that he discusses in his book.

By filter, I do not mean that the Court is or should be some sort of impermeable barrier to international law. Rather, the idea is that the Court should ensure that when international law passes into the U.S. legal system, it does so in a manner consistent with domestic constitutional values. Although this filtering process might in some instances dilute or narrow international law as it is applied within the United States, this is not inevitably the result. Filters can operate to improve and refine something for a particular purpose—think of a filter for coffee, for example—and this is often what happens when U.S. courts attempt to tailor international law to the U.S. domestic system.

This filtering role is needed because international law is generated through processes that often make it ill-suited for direct application in the U.S. legal system, and because it is frequently designed to perform functions different from those demanded of domestic law. The two principal sources of international law are customary international law and treaties. Customary international law arises out of the evolving practices and beliefs of nations.2 Although the United States contributes to its formation and change, this body of law does not require any specific approval process in the United States. Moreover, because customary international law is unwritten and evolving, its content is often uncertain and contested. Indeed, even the types of evidence that should count toward ascertaining its content are the subjects of substantial dispute.3 Because of its contested and evolutionary character, determinations of the content of customary international law implicate not only legal considerations but also considerations of U.S. foreign policy.4

#### No spillover – zero ev that the plan’s one use of CIL will be broadly included

#### CIL not key – international coop is ingrained in multiple institutions

Estreicher 3 Law Professor at NYU, (Samuel, “Rethinking the Binding Effect of Customary International Law,” Virginia Journal of International Law Association, Fall, 44 Va. J. Int'l L. 5)

As for the subsidiary law that an increasingly interdependent world needs in advance of treaties, traditional CIL could not easily play this role as it was essentially backwards looking. The new, instantaneous customary law tries to play this role, but in a way that hardly comports with legitimacy. Without relying on CIL, states, international organizations, and other actors have ample means of identifying problems requiring interstate cooperation, drafting instruments that might command state support, and marshaling the forces of moral suasion. It is hard to see that the "law" aspiration of CIL offers the prospect of a significant incremental gain. In any event, the ultimate question is whether any such benefit warrants the accompanying costs - to which I now turn.

### Court CP – CIL – 2AC

#### Or – doesn’t solve – leaves Parker immunity on the books in context of antitrust laws – providing shield for private entities and chilling states

Squire 6 [Richard Squire Fordham University School of Law Professor, 2006 https://ir.lawnet.fordham.edu/cgi/viewcontent.cgi?article=1066&context=faculty\_scholarship]

My proposed rules would be judge-made, which raises a threshold question. The preemptive scope of federal antitrust law is ultimately a question of congressional intent (at least to the extent that Congress does not overreach the Commerce Clause). And Congress unlike courts is not bound under principles of stare decisis to pay deference to previous judicial interpretations of the Sherman Act. Why then do I propose new judge-made rules rather than new legislation?

Despite the superficial merits of a congressional solution, I believe that a judicial fix is both possible and preferable. It is possible because, the dignity of precedent notwithstanding, courts that have tangled themselves in confused doctrine are not permitted simply to sit down and wait for Congress to rescue them. They must soldier on, cutting through thickets of their own creation if necessary. It is for this reason that principles of stare decisis permit courts to depart from precedent that is "badly reasoned," 10 7 marked by "indeterminacy," 1 08 or a "continuing source of confusion.'" 0 9

[Footnote 109] 109. Dixon, 509 U.S. at 710; see also Nichols v. United States, 511 U.S. 738, 744-45 (1994) (noting that precedent may be overruled if it lacks a "coherent rationale" and creates "confusion in the lower courts").

And there are few surer recipes for confusion and indeterminacy than the Court's violation requirement, which is contradicted by the facts of every state-action immunity case in which the Court has blocked enforcement of state law, and which causes judges to ignore basic questions such as whether a litigant wishes federal or state law declared unenforceable. Also, adherence to precedent is supposed to promote "reliance on judicial decisions,"' 1 0 but no good can come from reliance on jurisprudence that is inherently misleading. State legislators who searched for antitrust cases in which the Supreme Court actually mentions preemption would find only those decisions (such as Rice) in which the Court faithfully applies the violation requirement to uphold the state law in question. The decisions (such as Midcal) that are most relevant to legislators-in which the Court strikes down state law despite the lack of a violation-do not even mention preemption, and thus lie as traps for the unwary. And even these decisions do not announce that the violation requirement is a fiction; legislators can detect this crucial fact only if they also understand the complicated antitrust definition of a vertical price-fixing agreement. Finally, legislators who discover the truth about the violation requirement are not thereby rewarded with clear drafting instructions: not even the best-informed lawmakers could reliably legislate around the type of open-ended judicial analysis seen in Hertz.

## Coops

## Regs CP

### Regulation CP – 2AC

#### Perm – do the counterplan – not functionally competitive – wrecks aff ground and justifies worst normal means counterplans like the 9-0 counterplan

Robinhood 20 [Robinhood Financial LLC. “What are Antitrust Laws?”. 10-6-20. https://learn.robinhood.com/articles/4x5oCZOtg43uORfxEnxPRW/what-are-antitrust-laws/]

Antitrust laws are regulations that aim to promote fair business competition in an open market and protect consumers by banning certain predatory practices.

## Soverignty

### States Threaten CP – Federalism – 2AC

#### Failure to meaningfully constrain anticompetitive effects from Parker causes the Court to obliterate state role

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]

Conclusion

It is common to observe that since Garcia v. San Antonio Metro, there are no judicially-enforced boundaries between federal and state power. Federalism, in other words, is dead. 284 But in fact, judicially-enforced federalism - lurking behind an obscure and technical area of law known as state action antitrust immunity - is very much alive. For most of the last century, the Court quietly tinkered away with the contours of this federalism, struggling under the false formalism of a discernable boundary between state regulation and private cartels. But with the Court's last three antitrust cases, the tinkering has given way to reformation.

What used to be a doctrine with deep roots in constitutional federalism - the sort now declared "dead" - is now a doctrine with close ties to the federal administrative state where courts sit in judgment of an agency's procedure. The change is a welcome one, both because the old antitrust federalism was unworkable and because the new regime of accountability review addresses the inherent capture at the heart of modern state regulation, while affording some deference to state regulatory choices. Accountability review mitigates the risk of delegated self-regulation while retaining some deference - without which antitrust federalism would not be federalism at all.

The success of the new regime depends on how the Court defines its requirement that states "actively supervise" self-regulation or else expose it to antitrust challenge. The Court should only find "active supervision" where the state's politically accountable actors have taken transparent responsibility, not only for the regulation in general, but also for its specific anticompetitive effects. Without giving accountability review such bite, states will continue to selectively repeal the Sherman Act in the guise of self-regulation. If the new antitrust federalism fails to rein in the self-dealing epitomized by the current state of professional licensing, [\*1445] for example, the Court may be forced to take a heavier hand against the states and sacrifice federalism at the altar of competition. But abandoning the federalism of antitrust federalism is strong medicine; better to give the new antitrust federalism a fighting chance and save its obliteration for another day.

### State Regs Good – 2AC

#### Reasonable regulation allowed even if Parker were abandoned

Meese 15 [Alan J. Meese, Ball Professor of Law and Cabell Research Professor, William and Mary Law School, 2015 https://ilr.law.uiowa.edu/assets/Uploads/ILR-100-5-Meese.pdf]

Like Professor Hovenkamp, I too am uncomfortable with the Parker, Exxon, and ARC America trio. As others have noted, Parker arose when serious people believed that state-enforced cartelization or monopolization could help stabilize the macro economy—a claim that only politicians make today. All three decisions countenance some regulation by political entities that do not internalize the full costs of their actions. The predictable result will be too many state-imposed restraints and too much state antitrust regulation. Such overregulation, of course, will distort the allocation of resources and reduce national wealth. Moreover, to the extent that such regulation reduces price flexibility, Parker and its progeny interfere with the process of natural economic adjustment and thus exacerbate recessions. Far from destroying the ability of states to engage in regulation, reversal of such decisions would simply confine states to “reasonable” regulation, just as the Sherman Act confines private parties to reasonable restraints of trade. Federal preemption of state-imposed cartels, for instance, would leave states perfectly free to combat externalities, produce public goods, and redistribute income via taxing and spending.

### Federalism – Domestic Impact – Climate – 2AC

#### States can’t fill the federal void

Coglianese 2-20 – Cary Coglianese is the Edward B. Shils Professor of Law and Political Science at the University of Pennsylvania, where he is also the Director of the Penn Program on Regulation and the faculty advisor to The Regulatory Review, Shana Starobin is Assistant Professor of Government and Environmental Studies at Bowdoin College and a former Fellow of the Penn Program on Regulation at the University of Pennsylvania Law School, Let’s Be Real About State and Local Climate Action, Feb. 20th, 2018, https://www.theregreview.org/2018/02/20/coglianese-starobin-state-local-climate-action/

“Something is better than nothing.” “Don’t let the perfect be the enemy of the good.”

Who could take issue with aphorisms like these? They seem especially difficult to dispute today in the context of U.S. climate policy. Congress failed to adopt comprehensive national climate legislation during the Obama Administration. The Trump Administration has announced plans to pull out of the Paris Agreement and to repeal the U.S. Environmental Protection Agency’s (EPA) Clean Power Plan. In such a context, actions by state and local governments, along with voluntary efforts by industry, are all presumably better than nothing.

We are thus grateful to Craig Segall and David Hults for responding to an earlier essay of ours by extolling the virtues of various state and local climate initiatives. Yet as much as we personally share Segall and Hults’s hopefulness that “real progress” on climate policy can be made over the next several years, as scholars we have a duty to do more than just traffic in hope. Optimism can blind decisionmakers and the public to real policy challenges at the state and local level. More troubling still is the possibility of lulling the public into thinking the United States can adequately address climate change without federal action.

Segall and Hults respond to an essay we wrote that first appeared earlier this summer, not long after President Donald J. Trump had announced his intention to withdraw from the Paris Agreement. President Trump’s announcement prompted an immediate outpouring of responses from state and local leaders, many of whom pledged to work to meet the U.S. emissions reduction commitments under the Paris accord. Former New York City Mayor Michael Bloomberg perhaps best exemplified these leaders’ optimism when he declared, “We’re going to do everything America would have done if it had stayed committed.”

Yet achieving comparable reductions without national governmental action takes much more than optimism. Granted, a good number of scholars who we respect and admire—Cinnamon Carlarne, Dan Esty, Eric Orts, Barry Rabe, Chuck Sabel, among others—have been suggesting for years that successful environmental policy starts from the ground up, particularly from voluntary, collaborative action by non-federal actors. And in recent years, a variety of initiatives such as the U.S. Climate Alliance, Regional Greenhouse Gas Initiative, and the Pacific Coast Collaborative—have percolated “up” in the fashion that these scholars, as well as Segall and Hults, have described.

In the absence of any meaningful federal action, such bottom-up strategies would appear irrefutably to be better than nothing. It is certainly undeniable that any effective policy to reduce carbon emissions depends on behavioral change at the ground level. After all, as long as the U.S. energy system depends heavily on carbon-based fuels, then each person contributes in some way to greenhouse gas emissions.

Yet recognizing the need to change behavior at the local level neither logically nor empirically compels the conclusion that policy action on climate is best taken at the local level. On the contrary, as one of us has previously argued in print, a global problem like climate change will be best addressed through action at the broadest and highest governance level possible, such as through a national carbon tax or an upstream cap-and-trade system. Administering myriad local policies will prove costly and cumbersome. Diffuse responses require careful coordination to minimize leakage and regulatory arbitrage. And if they do not cover the entire country or planet, subnational efforts will inherently be restricted in their impact due to their limited geographic scope.

That is the reality in terms of where the United States stands today. A recent report released by the new initiative spearheaded by Michael Bloomberg and California Governor Jerry Brown trumpets the fact that “states, cities, and businesses constituting more than half of the U.S. economy have mobilized behind the U.S. pledge under the Paris Agreement.” But scratch beneath the surface and, as Amy Harder has noted, the pledges from states to date only cover “up to 35 percent of America’s total greenhouse gas emissions, according to the report’s appendix data,” which “means this group represents roughly less than 5 percent of the world’s emissions, despite comprising an economy that’s the world’s third-largest.”

As much as we laud those states, cities, and businesses that are taking voluntary action, they clearly do not address the vast majority of emissions in the United States. Any honest consideration of the potential for subnational action on climate policy also cannot ignore the fact that more than twenty-five states joined the litigation challenging EPA’s Clean Power Plan—as did the U.S. Chamber of Commerce, the National Association of Manufacturers, the American Chemistry Council, and a dozen other major business groups. Although voluntary compliance with public and private standards—such as through “green clubs” like America’s Pledge—may lead to some improved environmental outcomes, these efforts at best complement, but do not substitute for, mandatory national regulation in countries like the United States.

In addition to the inherent structural challenges of tackling a global problem through local action, the legal risks accompanying subnational action should not be overlooked. Once the federal government retreats from the Paris Agreement and abandons the Clean Power Plan, this does not necessarily give states a green light to take any action they please. As we outlined in our initial essay, states and localities can only go forward within the constraints of law. The Tenth Amendment’s affirmation of state autonomy does not immunize states from the kinds of potential legal challenges we outlined.

We see no reason to assume that such legal risks will not manifest themselves in the years ahead. Segall and Hults, for example, mention the authority California and other states have been afforded under the Clean Air Act to develop their own automobile emissions standards. Yet, as we mentioned in our original essay, California’s authority exists only insofar as the federal EPA has granted it a waiver that allows it to develop its own auto emissions standards and that permits other states to adopt California’s standards. It would not seem unreasonable still to imagine Administrator Scott Pruitt taking an interest in revisiting California’s waiver at some point.

States and localities need to move forward with their eyes wide open to the legal risks they face. That such risks exist will not, of course, mean that no action should be taken. But legal risks need to be confronted and managed—or at the very least understood and then accepted, when justified, as the price of acting.

Most imprudent of all would be to extoll the virtues of regional, state, local, and corporate climate action so that it might look like the United States—and the global community—will fare just fine even in absence of federal policy intervention. An enthusiastic embrace of subnational climate action unintentionally grants some cover to the federal government and may only serve to legitimate its current “do nothing” approach. For this reason, we obviously agree fully with Segall and Hults that “federal leadership, funds, and innovation are desperately needed.” To their credit, even the authors of the latest report from the Bloomberg-Brown initiative acknowledge that “non-federal policies cannot entirely replace federal climate action.”

#### No extinction from warming

Farquhar 17 – Sebastian Farquhar, Leader of the Global Priorities Project (GPP) at the Centre for Effective Altruism, et al., “Existential Risk: Diplomacy and Governance”, <https://www.fhi.ox.ac.uk/wp-content/uploads/Existential-Risks-2017-01-23.pdf> \*edited numbers for ease of reading

The most likely levels of global warming are very unlikely to cause human extinction.15 The existential risks of climate change instead stem from tail risk climate change – the low probability of extreme levels of warming – and interaction with other sources of risk. It is impossible to say with confidence at what point global warming would become severe enough to pose an existential threat. Research has suggested that warming of 11-12°[twelve degrees] C would render most of the planet uninhabitable,16 and would completely devastate agriculture.17 This would pose an extreme threat to human civilisation as we know it.18 Warming of around 7°C or more could potentially produce conflict and instability on such a scale that the indirect effects could be an existential risk, although it is extremely uncertain how likely such scenarios are.19 Moreover, the timescales over which such changes might happen could mean that humanity is able to adapt enough to avoid extinction in even very extreme scenarios.

The probability of these levels of warming depends on eventual greenhouse gas concentrations. According to some experts, unless strong action is taken soon by major emitters, it is likely that we will pursue a medium-high emissions pathway.20 If we do, the chance of extreme warming is highly uncertain but appears non-negligible. Current concentrations of greenhouse gases are higher than they have been for hundreds of thousands of years,21 which means that there are significant unknown unknowns about how the climate system will respond. Particularly concerning is the risk of positive feedback loops, such as the release of vast amounts of methane from melting of the arctic permafrost, which would cause rapid and disastrous warming.22 The economists Gernot Wagner and Martin Weitzman have used IPCC figures (which do not include modelling of feedback loops such as those from melting permafrost) to estimate that if we continue to pursue a medium-high emissions pathway, the probability of eventual warming of [six degrees] 6°C is around 10% [ten percent],23 and of [ten degrees]10°C is around 3%[three precent].24 These estimates are of course highly uncertain.

It is likely that the world will take action against climate change once it begins to impose large costs on human society, long before there is warming of 10°[ten degrees] C. Unfortunately, there is significant inertia in the climate system: there is a 25 to 50 year lag between CO2 emissions and eventual warming,25 and it is expected that 40% of the peak concentration of CO2 will remain in the atmosphere 1,000 years after the peak is reached.26 Consequently, it is impossible to reduce temperatures quickly by reducing CO2 emissions. If the world does start to face costly warming, the international community will therefore face strong incentives to find other ways to reduce global temperatures.

## Clog

### Court Clog – 2AC

#### NC Dental confusion causes litigation now – 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

#### Court clog impact wrong

Ware 13 Stephen, Professor of Law, University of Kansas. J.D. University of Chicago, 1990; B.A. University of Pennsylvania, 1987., 2013 Yeshiva University, Cardozo Journal of Conflict Resolution, IS ADJUDICATION A PUBLIC GOOD? "OVERCROWDED COURTS" AND THE PRIVATE SECTOR ALTERNATIVE OF ARBITRATION, Lexis

Courts are underfunded, dockets are crowded, and litigation is slow. These observations lead many lawyers and judges to call for increased court funding. While I would like to see a significantly higher percentage of government spending go to courts, I do not believe that is likely to happen. So I suggest we think about "underfunded" courts differently. Courts provide a service - binding adjudication - to disputing parties. This service is heavily subsidized by tax dollars, as only a portion of courts' costs are covered by fees paid by litigants. This public subsidy, basic economics suggests, causes demand for this service to exceed supply so disputing parties queue up to receive the subsidy. A court's time and other resources are allocated among parties according to their willingness to wait. In contrast, other goods and services are, in a market economy, allocated according to willingness to pay. If parties had to pay more to use the court system, fewer would use it, and thus those who did would not have to wait so long. In short, the related phenomena of "**underfunded" courts, crowded dockets and justice delayed** are caused by the public subsidy for litigants. Focus on this subsidy for parties in litigation enables a contrast with the absence of a subsidy for parties in the private sector alternative to litigation, arbitration, which (like litigation) also provides disputing parties with binding adjudication. While the public-sector court system provides binding adjudication virtually free of charge to the disputing parties, the private sector arbitration system generally charges them something like market rates for it. [\*900] Which disputing parties deserve subsidized adjudication and which should have to pay market rate for it? Our society's failure to confront this important question allows all disputing parties to pursue the subsidy for themselves. The result is that parties who do not deserve the subsidy - parties who should be paying market rates for adjudication - are consuming public resources that would be better spent on parties who do deserve the subsidy. One way to end the public subsidy for cases that do not deserve it is for courts to charge the parties to such a case a fee high enough to reimburse the court for its costs of adjudicating the case. Several thoughtful commentators have proposed such "user fees." This Article assesses those proposals and suggests that user fees would make litigation look more like arbitration. It concludes by considering the possibility that the public-sector court system and private arbitration organizations could compete in the market for unsubsidized adjudication and in the market for subsidized adjudication. In short, this Article places discussions of overcrowded courts and court user fees in the context of a society - our society - with a strong private sector alternative to our courts. II. "Overcrowded Courts" and the Private Sector Alternative of Arbitration A. "Overcrowded Courts" The economic downturn of the last few years required many families and businesses to reduce their spending. The same is true of state court systems. n1 State court funding cuts in recent years have prompted protests decrying the harms caused by underfunded courts. n2 In the words of American Bar Association ("ABA") President [\*901] Bill Robinson, "state court underfunding is a threat to our system of justice and all we believe in as Americans and as an association. It is harming clients, slowing our nation's economic recovery and undermining our liberty." n3 If the reality is anywhere near this dire - "a threat to our system of justice and all we believe in as Americans" - then we truly have a crisis on our hands. Still worse, it appears to be a long-running crisis. Cries of alarm about underfunded courts, crowded dockets and justice delayed, which we all know is justice denied, n4 have been sounded by lawyers and courts for over a half a century. In 2012, the ABA President warned that "court underfunding is a threat to our system of justice." n5 Similarly, the previous decade was also a "time of scarce judicial resources and crowded dockets" n6 so the ABA in 2004 "formed a Commission on State Court Funding ... to point out that underfunded courts lack adequate resources to meet caseload demands." n7 Similarly, hanging over the 1990's was a "looming crisis in the nation" due in part to "dangerously crowded dockets" and "overburdened judges." n8 In 1993, an [\*902] ABA committee issued a report providing an "Overview of the Crisis in America's System of Justice." n9 Going back further in time reveals more of the same. In the 1980's, one ABA president wrote a column entitled "the underfunded commitment to justice," n10 and a few years later a different ABA president said "we must attack the underfunding of the justice system." n11 In the 1970's, an ABA report said problems like "overcrowded dockets" and "generally inadequate resources" had "reached crisis proportions." n12 While this "crisis" in the 1970's was "alarming," n13 in the 1960's it was "staggering." n14 A 1969 commentator said "the increased workload which has engulfed the courts had already stretched our judicial system to its limits by the mid-twentieth century." n15 This assessment of the mid-twentieth [\*903] century is confirmed by a 1952 report stating that "the problem of the crowded docket is one which in recent years has grown more and more disturbing." n16 Some suggest this problem goes back, not just these sixty years, but for hundreds, or even thousands, of years. n17 In short, the "crisis" of "underfunded" courts, crowded dockets and justice delayed may always be with us. n18

### Water Disputes – 2AC

#### No impact – empirics are aff and even if they win water tension, those are non-militarized

Risi 19 [Lauren Risi is the Program Director of the Environmental Change and Security Program at the Wilson Center. She has authored and edited a number of reports, including: 21st Century Diplomacy: Foreign Policy is Climate Policy; Navigating Complexity: Climate, Migration, and Conflict in a Changing World; After the Disaster: Rebuilding Communities; Backdraft: The Conflict Potential of Climate Change Adaptation and Mitigation; and Our Shared Future: Environmental Pathways to Peace. Risi holds a Master’s Degree in environmental security. Also, internally quoting Geoff Dabelko, former director and current senior advisor to the Wilson Center’s Environmental Change & Security Program. “BEYOND WATER WARS” – The Wilson Quarterly - SUMMER 2019 - #E&F – Modified for language that offend - https://www.wilsonquarterly.com/quarterly/water-in-a-world-of-conflict/beyond-water-wars/]

Concern over “water wars” writ large has gained renewed traction as climate change, continued population growth, and increasingly polluted waterways pose growing risks to the world’s water. It remains a go-to concept, no matter what the facts are.

“We’re ~~seeing~~ (witnessing) some of the same headlines we’ve been trying to knock down for going on 30 years,” says Geoff Dabelko, former director and current senior advisor to the Wilson Center’s Environmental Change & Security Program. “Despite the seemingly irresistible temptation for politicians and headline writers to proclaim otherwise, countries have not fought wars over water.”

Researchers have put the notion of "water wars" to the test. An analysis in the 1990s of 263 international water basins conducted by Aaron Wolf, Shira Yoffe, and colleagues at Oregon State University found conclusively that states are much more likely to cooperate over shared water than go to war. In fact, while water may be one of many factors influencing skirmishes between states, wars have rarely, if ever, been fought over water. To date, this finding continues to be backed up by empirical studies.

Dabelko says that the implications of clinging to the broad concept of “water wars” between nations comes at a cost. “When we focus so heavily on potential interstate wars over water,” he says, “we miss the mark on how important water is to fostering cooperation, to achieving development goals, and to managing the inevitable tensions over competing uses for water at local levels.”

#### Perez is proscriptive, not descriptive. Also assumes State Courts and SEPARATE Water courts.

MSU = Green

Perez ’19 [Vanessa; 2019; Associate Professor of Law at Texas A&M, Associate Research Professor at the Texas A&M Department of Agricultural Economics, J.S.D. from New York University, L.L.M. from the University of Chicago; Environmental Law, “Specialization Trend: Water Courts,” vol. 49]

I. Introduction

Definition of property rights is an essential solution to the tragedy of the commons 1 from which many of our natural resources suffer. The scholarship analyzing how property rights are created and how they evolve often takes for granted the enforcement of those rights. 2 Enforcement is key. Enforcement is a public good often, but not exclusively, provided by [\*589] government. Enforcement takes many different forms: from ostracism in self-governed property rights systems to administrative agencies' resolutions and judicial decisions in formal property right systems.

This Article focuses on the last step in the enforcement of water rights: the courts. In particular, it analyzes whether the introduction of water courts is advisable in western United States. Currently, water rights are first enforced by administrative agencies, and the decisions of those agencies may be challenged in court. For example, a water rights holder may challenge a water agency's denial of a location change for their water right. 3 Additionally, private parties may bring claims against other water rights holders to court. Presently water cases are heard by generalist state courts. However, water law cases may unduly burden the dockets of those generalist courts. 4 Courts decide on many different areas and the complexity of the facts and the law in water law cases suggests that a different institutional design, one with specialized courts, may be more efficient. 5 The gains in efficiency will come from a faster, more accurate resolution of cases. 6

Specialized courts are quite common from a comparative perspective in areas as varied as corporate matters, tax issues, gender violence, administrative law, family law, or patents. 7 One such area is environmental law. Forty-two countries have specialized environmental courts. For example, India created the Green Tribunal in 2010, 8 New South Wales (Australia) has the Land and Environmental Courts that hear environmental and land use cases since 1979. 9 Sweden, in 2011, replaced property and environmental courts for a system of Land and Environment Courts which also hears water cases. 10

In the United States, the generalist judge is celebrated. 11 Judge Posner wrote in defense of the generalist judge in 1983. 12 While in 1990, the United States Judicial Conference qualified them as "exotic," 13 around that time the [\*590] Vermont Superior Court Environmental Division 14 and the Shelby County-Tennessee Environmental Court 15 were created. Setting aside the specialization of administrative law judges such as the United States Environmental Protection Agency administrative law judges or the environmental appeals board, 16 there are plenty of examples of specialized courts in the United States, such as bankruptcy courts or Federal Circuit Court of Appeals. 17

Water law has not been immune to specialization at the judicial level. Water law is similar to environmental law 18 and patent law because both the facts and the regulations are very complex. In fact, across the world, water issues have often prompted the establishment of environmental courts and tribunals. 19 In the United States, only Colorado has a system of water courts. 20 These courts have been in place since 1969 21 but, surprisingly, the literature about specialized courts has not paid much attention to these Colorado courts. *In addition*, some specialized courts, created to deal with the adjudication processes in the western states where water rights were not properly recorded, are becoming permanent courts of limited jurisdiction. 22 While there are few examples, water courts are not frequent. However, voices advocate for them. For example, in California, when drought strikes, there are often claims of the need for water courts. 23

This Article analyzes whether water law courts are a sound reform to deal with water rights disputes in an era of climate change which will inevitably make water disputes more common. Water courts compete with general courts as a forum for dispute resolution, but they also compete with market mechanisms or with political deal-making as alternative ways to [\*591] solve water conflicts. 24 A better system of judicial decision making should reduce the overall social costs of water conflicts.

In order to assess the suitability of water courts, the Article starts by analyzing the comparative advantages and disadvantages of specialized courts in relation to the current system of generalist courts. Second, it looks at some examples of existing water courts in the United States and beyond, namely the Water tribunal of Valencia, the South Africa Water Court, Colorado Water Courts, and the Montana Water Court. Third, the Article describes the trend towards specialization in water law judicial decision making and distills the characteristics that a water court should have and how those could also inform the establishment of other specialized judicial institutions for other natural resources.

II. Specialized Tribunals

Specialized courts are expected to make quicker decisions, reducing the workload of regular courts, and provide higher quality decisions, thus ensuring legal coherence and uniform judicial decisions. 25 Beyond these advantages that all scholars agree on, some works on specialized courts identify additional advantages. 26 The study Greening Justice about the potential for environmental courts lists visibility as an advantage. 27 The report understands environmental courts as a way to increase the public relevance of a subject because by creating these courts, the government shows that environmental issues are a topic of great importance. 28 The lessons offered here for specialized water courts can be translated to many other areas.

If all the above advantages were realized, private parties should favor specialized courts because they would greatly reduce the cost of doing business in the subject matter areas where those courts specialize. 29 Additionally, a trustworthy, respected judicial system is a key part of procedural environmental justice. 30 Some scholars consider specialized [\*592] courts as increasing public confidence 31 in the system, which in turn may enjoy greater legitimacy. 32 Subpart A below will focus on the two advantages that encompass all the additional ones listed in the current scholarship on the topic: celerity and quality of adjudication 33

# 1AR

## Case

### 1AR---AT: Link

#### 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.

#### Independently, broad Parker immunity chills state regulation and impedes freedom of action

Weber 16 [Jayme Weber, University of Arizona, James E. Rogers College of Law, J.D., 2016 https://www.cato.org/sites/cato.org/files/pubs/pdf/teladoc-285th-cir-29.pdf]

III. REFUSING SELF-INTERESTED BOARDS IMMUNITY FROM ANTITRUST LIABILITY IS FULLY CONSISTENT WITH FEDERALISM

“Federal antitrust law . . . is ‘as important to the preservation of economic freedom and our free-enterprise system as the Bill of Rights is to the protection of our fundamental personal freedoms.’” Dental Exam’rs, 135 S. Ct. at 1109 (quoting United States v. Topco Assocs., Inc., 405 U.S. 596, 610 (1972)). Every business, regardless of its size, is guaranteed the freedom “to assert with vigor, imagination, devotion, and ingenuity whatever economic muscle it can muster.” Topco, 405 U.S. at 610. Antitrust laws—particularly the Sherman Act—are “the Magna Carta of free enterprise,” and play a crucial role in upholding the national policy of economic freedom for anyone wishing to compete in the marketplace. Id.

In line with this national policy, the states clearly have an interest in preventing anticompetitive behavior and fostering robustly competitive markets within and across their borders. State governments also have an interest in reserving the ability to create regulatory subdivisions to which they can delegate some of their authority to accomplish specific tasks. At times, the states may deem it appropriate to design a regulatory body to deliberately exempt it from antitrust laws to achieve a specialized purpose.

States may confer antitrust liability on regulatory bodies—but only under certain conditions. Applying the state-action immunity doctrine too broadly and giving private actors a limitless ability to claim antitrust immunity for themselves would empower state-created cartels to “make economic choices counseled solely by their own parochial interests and without regard to their anticompetitive effects,” disrupting the free enterprise system that protects the national policy of economic freedom. Lafayette, 435 U.S. at 408.

Furthermore, broad application of the Parker-immunity doctrine would actually undermine the states’ ability to effectively delegate authority to specialized or local regulatory bodies by endowing these bodies with an antitrust immunity that state governments may have never meant to give them. “Neither federalism nor political responsibility is well-served by a rule that essential national policies are displaced by state regulations intended to achieve more limited ends.” Ticor, 504 U.S. at 636. The doctrine enables states to create regulatory subdivisions that do not interfere with the interest in preserving the benefits of competition. By “adhering in most cases to fundamental and accepted assumptions about the benefits of competition within the framework of the antitrust laws,” courts actually increase rather than diminish the states’ regulatory flexibility. Id. State legislatures may wish to make broad delegations of authority to their political subdivisions in order to maximize the benefits of the specialized governance those bodies offer— but that does not necessarily mean that state legislatures always want to give those entities the ability to violate the federal antitrust laws.

“When a state grants power to an inferior entity, it presumably grants the power to do the thing contemplated, but not to do so anticompetitively.” Phillip E. Areeda & Herbert Hovenkamp, Antitrust Law ¶ 225a, at 131 (3d ed. 2006). Relying on the backdrop of the national policy favoring competition, states may enact such broad delegations that are nevertheless intended to create specific and narrow, rather than general and wide-reaching, regulatory schemes. Giving regulatory agencies state-action immunity too readily would undermine states’ ability to do so, creating the hazard that legislatures will inadvertently authorize anticompetitive conduct. State legislatures cannot possibly anticipate every potential anticompetitive consequence of these delegations of authority and explicitly disavow antitrust immunity for every one. “‘No legislature . . . can be expected to catalog all of the anticipated effects’ of a statute delegating authority to a substate governmental entity.” Phoebe Putney, 133 S. Ct. at 1012 (quoting Hallie, 471 U.S. at 43).

If a state intends a specific anticompetitive result, it may clearly articulate that result—or make it plainly foreseeable, see id. at 1011—giving voters the chance to oppose immunity-creating legislation before it becomes law and making it easier to hold legislators accountable. Otherwise, states would be impeded in their freedom of action because they would have to act “in the shadow of state-action immunity whenever they enter[ed] the realm of economic regulation.” Ticor, 504 U.S. at 636. The limited and careful application of the state-action immunity doctrine gives states the most freedom in delegating power and crafting regulatory entities, ensuring legislatures that they will not accidentally confer immunity and allow regulatory bodies to go rogue with anticompetitive conduct that deviates from the states’ interest of preserving robust marketplace competition for the benefit of their residents.

## DA

### 1AR---AT: Link

#### No link – the aff preserves state regulation – stricter standard still allows ample room

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]

IV. FTC Enforcement in a World without Parker Constraints

This Article has developed an argument from legislative history, historical context, and institutional capacity for according the FTC a preemptive capacity superior to the representation-reinforcement approach reflected in the Sherman Act doctrine. The ultimate appeal of any such doctrinal shift would depend significantly on what sort of preemptive role the commission might play with respect to anticompetitive state regulation. The representation-reinforcement paradigm—insisting as it does on state political accountability, but not substantively scrutinizing the regulatory decision—exists on a spectrum of possible modes of engagement between state and federal law. Application of some of these modes to FTC superior preemption would involve a considerably more drastic realignment of state and federal power and a considerably greater aggrandizement of FTC powers than others.

Any plausible theory of superior preemption would need to avoid rendering the FTC Act to condemn every state regulatory scheme that reduces competition. As Frank Easterbrook has noted, regulation almost always displaces competition,257 but it would be manifestly infeasible—not to mention fatal to the thesis of this Article—to hold the FTC Act preemptive of all statutes with anticompetitive effects. Rather, superior preemption would mean a firmer preemptive hand than the current Midcal representation-reinforcement regime, but would still need to allow ample room for pursuit of state regulatory interests other than pure consumer-welfare maximization— the commonly assumed goal of the FTC Act.258 Otherwise, a wide variety of longstanding state regulations designed to pursue legitimate social and economic objectives could be in jeopardy.

The superior-preemption doctrine might develop in part along categorical lines—such as by prohibiting the externalization of large costs on consumers outside the relevant political jurisdiction or rejecting certain classes of state regulation as categorically incompatible with federal antitrust law. However, much of the work would probably be done on a case-specific basis under some pre-established analytical framework. This final Part provides a framing perspective on three possible analytical approaches a superior-preemptive scheme might employ, independently or in some combination.

### 1AR---AT: I/L---Warming

#### States won’t take the lead on climate

Livermore 17 – Michael Livermore, Associate Professor of Law at the University of Virginia, Why state action is no answer to bonfire of US climate rules, August 8th, 2017, http://www.climatechangenews.com/2017/08/08/state-action-no-answer-bonfire-us-climate-rules/

President Donald Trump and his appointees, particularly Environmental Protection Agency Administrator Scott Pruitt, have made federalism a theme of their efforts to scale back environmental regulation.

They argue that the federal government has become too intrusive and that states should be returned to a position of “regulatory primacy” on environmental matters.

“We have to let the states compete to see who has the best solutions. They know the best how to spend their dollars and how to take care of the people within each state,” Trump said in a speech to the National Governors Association last February.

Some liberal-leaning states have responded by adopting more aggressive regulations. California has positioned itself as a leader in the fight to curb climate change. New York is restructuring its electricity market to facilitate clean energy. And Virginia’s Democratic governor, Terry McAuliffe, has ordered state environmental regulators to design a rule to cap carbon emissions from power plants.

State experimentation may be the only way to break the gridlock on environmental issues that now overwhelms our national political institutions. However, without a broad mandate from the federal government to address urgent environmental problems, few red and purple states will follow California’s lead. In my view, giving too much power to the states will likely result in many states doing less, not more.

What’s so great about the states?

Politicians are happy to praise states’ rights, but they rarely say much about what federalism is supposed to accomplish. Granting more power to the states should not be an end unto itself. Rather, it’s a way to promote goals such as political responsiveness, experimentation and policy diversity.

Many US environmental laws include roles for states and the federal government to work cooperatively to achieve shared objectives. Often, this involves the federal government setting strict goals, with states taking the lead on implementation and enforcement. This careful balance of federal and state power has been implemented by Republican and Democratic administrations alike.

In recent years, scholars have expanded on Justice Brandeis’ famous “laboratories of democracy” model of federalism with the notion of “democratic experimentation.” Brandeis’ core insight, updated for contemporary society, is that decentralization lets state and local governments experiment with different policies to generate information about what works and what doesn’t. Other states and the national government can use those insights to generate better policy outcomes.

California Governor Jerry Brown announces that his state will host an international climate change action summit in September 2018 – the first such meeting to be held in the United States.

But as I have shown in recent work, there is no guarantee that state experimentation will produce neutral technical information. It also can generate political information that can be put to good or bad uses.

For example, state experimentation with pollution controls may allow regulators to identify cheap ways to reduce emissions. On the other hand, big polluters may use the opportunity to figure out clever ways to avoid their obligations.

This happened in the 1970s and ‘80’s after the Clean Air Act was enacted. State experimentation allowed polluters to learn that by building very tall smokestacks at electric power plants, they could send pollution downwind while keeping local officials happy. Experimentation resulted in information on how to push pollution around instead of cleaning it up, and utilities in midwest states used this knowledge to shift pollutants to states downwind in the Northeast.

An elusive balance

It makes rhetorical sense for the Trump administration to wrap its environmental agenda in federalism. Air and water pollution are unpopular, and conservation groups have called out Trump’s policies and budget for undoing “environmental safeguards.”

Reframing deregulation as federalism turns the issue into a debate about how to allocate power between the national government and the states. But striking the right balance between federal and state power requires careful attention to context and the costs and benefits of decentralization.

For example, Pruitt has formally proposed to rescind the Clean Water Rule, an Obama administration regulation that clarifies the jurisdiction of EPA and the Army Corps of Engineers to regulate smaller water bodies and wetlands under the Clean Water Act. One might think that without EPA on the beat, states will take a more central role in water pollution control. But in fact, many states have passed laws banning any clean water regulation that is more stringent than federal standards. Shifting responsibility in this area back to states will create a policy vacuum instead of space for experimentation.

Less creativity, not more

There is even more need for a federal role in addressing problems that have global impacts, such as climate change. Once greenhouse gases are emitted, they do not just cause warming in the place where they were released. Instead, they mix in the atmosphere and contribute to climate change around the world. This means that no given jurisdiction pays the full cost of its emissions. Instead, in the language of economics, these impacts are externalities that are felt elsewhere.

This is why a global agreement is needed to effectively slow climate change. The United States has already withdrawn from the Paris climate accord. If we pull back on regulating greenhouse gases nationally as well, many states will have little incentive to take action.

Under the Obama administration’s Clean Power Plan, which Pruitt is reviewing and has told states to ignore, every state was required to figure out how to meet a carbon reduction goal. However, it did not dictate how they should do it.

This approach would have produced valuable political information from red and purple states, which tend to rely more heavily than blue states on fossil fuels. By forcing Republican leaders to craft state climate policies and sell them to their constituents, the Clean Power Plan promoted what I consider truly useful experimentation that could have helped break the national gridlock on climate policy.

Now, without a prod from the federal government, those experiments are unlikely to occur. EPA’s retreat will mean that we have less, not more, insight into smart and politically viable ways of cutting carbon emissions.

Any regulation can be improved on, and the Trump administration could have risen to that challenge. Instead, the leadership at EPA is abdicating the agency’s traditional leadership role. In doing so, it is promoting stagnation and backsliding rather than innovation.

#### Laundry list of legal challenges block state action

Coglianese 17 – Cary Coglianese is the Edward B. Shils Professor of Law and Political Science at the University of Pennsylvania, where he is also the Director of the Penn Program on Regulation and the faculty advisor to The Regulatory Review, Shana Starobin is Assistant Professor of Government and Environmental Studies at Bowdoin College and a former Fellow of the Penn Program on Regulation at the University of Pennsylvania Law School, The Legal Risks of Regulating Climate Change at the Subnational Level, Sept. 18th, 2017, https://www.theregreview.org/2017/09/18/coglianese-starobin-legal-risks-climate-change-subnational/

Moreover, subnational policies also face legal risk. Businesses that operate across multiple jurisdictions can be expected to complain about a complex patchwork of rules. The Trump Administration itself may seek to defend its national policy of “energy dominance.” Overall, subnational officials can expect one or more of at least six potential legal challenges.

First, even as the Trump Administration retreats from Obama-era climate policies, much federal environmental and energy law will remain on the books and could give rise to challenges like those Albuquerque faced. The Energy Department, for example, continues to regulate HVAC equipment—and those standards have support from industry because they avoid a patchwork quilt of state laws.

Second, subnational climate regulation could raise “dormant” Commerce Clause challenges. Even when no federal law exists to conflict with state or local regulation, subnational rules can be unlawful if their burden on interstate commerce is “clearly excessive in relation to the putative local benefits”—a test the Supreme Court announced in Pike v. Bruce Church, Inc. Legal challenges under Pike are generally hard to win; however, with climate regulation, even cities and states with the greatest environmental susceptibility could find their rules facing legal vulnerability. The marginal benefits of a single local jurisdiction’s requirements on a global environmental problem will necessarily be small.

Third, once the Trump Administration actively withdraws certain federal climate change regulations, the Commerce Clause will no longer be completely “dormant.” Challengers to subnational regulation will likely argue that state and local efforts to fill in the new void are preempted by affirmative federal policy decisions to create such a void—not mere indifference.

Fourth, assuming the Clean Power Plan is rescinded in spite of the likely legal challenges by environmental groups, any subnational regulation of the power sector will likely increase prospects for legal or administrative challenge to utility rate requests prompted by increased regulatory costs. After all, these costs will no longer be mandated by federal law.

Fifth, state automobile emissions regulations depend on a U.S. Environmental Protection Agency (EPA) waiver from federal standards. California has received such a waiver which has allowed other states to adopt California’s more stringent standards. But at his Senate confirmation hearings, EPA Administrator Scott Pruitt expressed a willingness to reconsider California’s waiver—a move the auto industry would presumably support but that will also generate litigation by environmentalists.

Finally, expect to hear the argument that climate policy is foreign policy—and thus is under federal control. Whether this argument will win remains to be seen. For one thing, as our colleague Jean Galbraith insightfully suggests, courts may prefer limits arising under domestic rather than foreign affairs law. But foreign affairs lawsuits seem all the more plausible with each additional climate meeting that California’s Governor Jerry Brown holds with foreign leaders.