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## 1AC – Fullertown

### Innovation Adv

#### Advantage One: Innovation

#### Broad 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.

#### Disease is a non-liner existential risk – precautionary principle key

Diamandis 21 (Eleftherios P. Diamandis, Division Head of Clinical Biochemistry at Mount Sinai Hospital and Biochemist-in-Chief at the University Health Network and is Professor & Head, Clinical Biochemistry, Department of Laboratory Medicine and Pathobiology, University of Toronto, Ontario, Canada, April 14th 2021, “The Mother of All Battles: Viruses vs. Humans. Can Humans Avoid Extinction in 50-100 Years?” modified to fix author typo [“could result n” 🡪 “could result in” <https://www.preprints.org/manuscript/202104.0397/v1>) MULCH

The recent SARS-CoV-2 pandemic, which is causing COVID 19 disease, has taught us unexpected lessons about the dangers of human extinction through highly contagious and lethal diseases. As the COVID 19 pandemic is now being controlled by various isolation measures, therapeutics and vaccines, it became clear that our current lifestyle and societal functions may not be sustainable in the long term. We now have to start thinking and planning on how to face the next dangerous pandemic, not just overcoming the one that is upon us now. Is there any evidence that even worse pandemics could strike us in the near future and threaten the existence of the human race? The answer **is** unequivocally yes. It is not necessary to get infected by viruses of bats, pangolins and other exotic animals that live in remote forests in order to be in danger. Creditable scientific evidence indicates that the human gut microbiota harbor billions of viruses which are capable of affecting the function of vital human organs such as the immune system, lung, brain, liver, kidney, heart etc. It is possible that the development of pathogenic variants in the gut can lead to contagious viruses which can cause pandemics, leading to destruction of vital organs, causing death or various debilitating diseases such as blindness, respiratory, liver, heart and kidney failures. These diseases could result [in] the complete shutdown of our civilization and probably the extinction of human race. In this essay, I will first provide a few independent pieces of scientific facts and then combine this information to come up with some (but certainly not all) hypothetical scenarios that could cause human race misery, even extinction. I hope that these scary scenarios will trigger preventative measures that could reverse or delay the projected adverse outcomes.

#### **Independently, health innovation solves ABR – more market access is key**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

INTRODUCTION

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

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

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

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

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

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

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

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

I. WHY ANTICOMPETITIVE REGULATION SUCCEEDS

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

A. The Generic Story

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

B. Additional Considerations Affecting Product Market Innovation

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

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

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

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

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

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

C. An Illustration from Automobile Distribution

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

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

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

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

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

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

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

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

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

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

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

A. Lochner, anti-Lochner, and Parker

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

B. The Potential for an Increased Level of Judicial Scrutiny

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

B. Considering Governmental Justifications for Restraints on Competition

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

C. Institutional and Procedural Distinctions

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

### Plan

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

### Federalism Adv

#### Advantage Two: Federalism

#### 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

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

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

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

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

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

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

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

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

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

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

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

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

**Second is spillovers**

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

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

1. Compacts meet “Federalism 3.0”

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

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

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

2. Horizontal harms in practice

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

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

#### Loss of Congressional capacity causes extinction

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

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

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

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

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

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

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

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

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

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

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

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

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

Recommendations

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

1. Invest in the future.

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

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

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

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

#### Factionalism causes adversary probing that collapses security

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

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

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

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

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

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

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

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

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

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

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

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

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

#### That goes nuclear

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

The first and possibly most dangerous path to escalation would arise from the early use of cyberweapons in a great power crisis to paralyze the vital command, control, and communications capabilities of an adversary, many of which serve nuclear and conventional forces. In the “fog of war” that would naturally ensue from such an encounter, the recipient of such an attack might fear more punishing follow-up kinetic attacks, possibly including the use of nuclear weapons, and, fearing the loss of its own arsenal, launch its weapons immediately. This might occur, for example, in a confrontation between NATO and Russian forces in east and central Europe or between U.S. and Chinese forces in the Asia-Pacific region. Speaking of a possible confrontation in Europe, for example, James N. Miller Jr. and Richard Fontaine wrote that “both sides would have overwhelming incentives to go early with offensive cyber and counter-space capabilities to negate the other side’s military capabilities or advantages.” If these early attacks succeeded, “it could result in huge military and coercive advantage for the attacker.” This might induce the recipient of such attacks to back down, affording its rival a major victory at very low cost. Alternatively, however, the recipient might view the attacks on its critical command, control, and communications infrastructure as the prelude to a full-scale attack aimed at neutralizing its nuclear capabilities and choose to strike first. “It is worth considering,” Miller and Fontaine concluded, “how even a very limited attack or incident could set both sides on a slippery slope to rapid escalation.”10 What makes the insertion of latent malware in an adversary’s NC3 systems so dangerous is that it may not even need to be activated to increase the risk of nuclear escalation. If a nuclear-armed state comes to believe that its critical systems are infested with enemy malware, its leaders might not trust the information provided by its early-warning systems in a crisis and might misconstrue the nature of an enemy attack, leading them to overreact and possibly launch their nuclear weapons out of fear they are at risk of a preemptive strike. “The uncertainty caused by the unique character of a cyber threat could jeopardize the credibility of the nuclear deterrent and undermine strategic stability in ways that advances in nuclear and conventional weapons do not,” Page O. Stoutland and Samantha Pitts-Kiefer wrote in 2018 paper for the Nuclear Threat Initiative. “[T]he introduction of a flaw or malicious code into nuclear weapons through the supply chain that compromises the effectiveness of those weapons could lead to a lack of confidence in the nuclear deterrent,” undermining strategic stability.11 Without confidence in the reliability of its nuclear weapons infrastructure, a nuclear-armed state may misinterpret confusing signals from its early-warning systems and, fearing the worst, launch its own nuclear weapons rather than lose them to an enemy’s first strike. This makes the scenario proffered in the 2018 NPR report, of a nuclear response to an enemy cyberattack, that much more alarming. Yet another pathway to escalation could arise from a cascading series of cyberstrikes and counterstrikes against vital national infrastructure rather than on military targets. All major powers, along with Iran and North Korea, have developed and deployed cyberweapons designed to disrupt and destroy major elements of an adversary’s key economic systems, such as power grids, financial systems, and transportation networks. As noted, Russia has infiltrated the U.S. electrical grid, and it is widely believed that the United States has done the same in Russia.12 The Pentagon has also devised a plan known as “Nitro Zeus,” intended to immobilize the entire Iranian economy and so force it to capitulate to U.S. demands or, if that approach failed, to pave the way for a crippling air and missile attack.13 The danger here is that economic attacks of this sort, if undertaken during a period of tension and crisis, could lead to an escalating series of tit-for-tat attacks against ever more vital elements of an adversary’s critical infrastructure, producing widespread chaos and harm and eventually leading one side to initiate kinetic attacks on critical military targets, risking the slippery slope to nuclear conflict. For example, a Russian cyberattack on the U.S. power grid could trigger U.S. attacks on Russian energy and financial systems, causing widespread disorder in both countries and generating an impulse for even more devastating attacks. At some point, such attacks “could lead to major conflict and possibly nuclear war.”14

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

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

Introduction

IN just three relatively obscure antitrust cases, 1

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

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

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

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

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

III. DOCTRINAL CRITICISM

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

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

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

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

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

IV. PROPOSED SOLUTIONS

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

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

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

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

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

B. Spillover Effects and Antitrust Federalism

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

#### Only federal legal remedies solve – failure to explicitly narrow Parker over-immunizes private entities and chills state 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.

#### 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.

# 2ac

## innovation

## fism

## t-courts

### 2ac t-courts

**Courts “define the scope”**

**Kades 19** [Michael Kades, “The State of U.S. Federal Antitrust Enforcement,” Washington Center for Equitable Growth, 9—17—19, https://equitablegrowth.org/research-paper/the-state-of-u-s-federal-antitrust-enforcement/?longform=true, accessed 6-2-21]

Antitrust enforcement is also often treated as a single entity, but multiple forces affect both the intensity and effectiveness of enforcement: enforcement activity (the number and type of cases that enforcers bring), the resources Congress provides for antitrust enforcement, and, in the federal system, the merger filing-fee system that has become the primary source of antitrust funding. These are not the only factors that affect antitrust enforcement. In the United States, judicial interpretationsdefine the scopeof the antitrust laws. The individuals running the antitrust agencies have broad discretion to determine which cases to pursue.

#### Courts on aff is better – they still get tons of process CPs but allow aff to actually solve

#### Court interpretation is the central question for the aff

**Crane 21** Daniel Crane, the Frederick Paul Furth, Sr. Professor of Law, University of Michigan. (January, 2021). “Antitrust Antitextualism.” *Notre Dame Law Review*, 96, 1205. <https://advance-lexis-com.proxy2.cl.msu.edu/api/document?collection=analytical-materials&id=urn:contentItem:621K-HKS1-F65M-6251-00000-00&context=1516831>. {DK}

This Article has shown that, historically, the judiciary has treated the antitrust statutes as broad delegations to the courts to create a pragmatic common law of competition, even when the statutes plainly said something more specifically prohibitory. What, then, are the strategies available to a reformist Congress seeking to rein in business power through remedial antitrust legislation?

The one strategy that does not seem especially promising is simply writing clearer statutes. The antitrust statutes that the courts wrote down in favor of big business did not suffer from a lack of clarity or, if they did, not in the textual implications the courts chose to ignore. Strikingly, the courts continue to insist that the antitrust statutes are indeterminate delegations of common-law power, even while admitting in candor that they have simply chosen to ignore the statutes' plain meaning in favor of a common method of deciding antitrust cases. For instance, in Professional Engineers, Justice Stevens remarked for the Court that "the language of § 1 of the Sherman Act ... cannot mean what it says" and therefore that Congress must not have intended "the text of the Sherman Act to delineate the full meaning of the statute or its application in concrete situations," thus justifying the courts in shaping the "statute's broad mandate by drawing on common-law tradition." 255Link to the text of the noteGiven over a century's tradition of interpreting antitrust statutes as invitations to continue a common-law process whatever else is suggested by the statute's text, it is difficult to see how simply accumulating stern new language in new texts would lead to a different result.

Even where reform statutes are textually honored in their immediate aftermath, history shows a creeping judicial tendency to begin integrating the reform statutes into the mainstream of antitrust jurisprudence within a few decades. This has been the fate of the four major antitrust reform statutes - the FTC, Clayton, Robinson-Patman, and Celler-Kefauver Acts - each of which was meant to rein in capital in ways that the Sherman Act did not. In all four instances, however, the courts incrementally began mainstreaming the statutes into Sherman Act precedent, creating a homogenous antitrust jurisprudence that read the textual distinctiveness out of the reform statutes. Thus, today, cases under the FTC Act, section 3 of the Clayton Act, and the Robinson-Patman Act are largely indistinct from Sherman Act cases, 256Link to the text of the noteand merger cases have been rolled into the same modes of price-theoretic analysis that would be employed in a Sherman Act case. 257Link to the text of the noteGiven that neither [\*1252] statutory text nor legislative history seems to have deterred the courts from this process within a few decades after the passage of the statutes, there is little reason to believe that a "this time we mean it" statutory reform would not meet the same fate. If the courts continue to understand aspects of the antitrust statutes as aspirationally motivated and operationally impracticable, the previously observed pattern is likely to continue.

#### It’s best---

#### Education---scope of state action immunity is vital question in antitrust enforcement---Crane & Sack

#### Aff flex---“core” laws are so broadly written that they massively constrain the aff---requiring aff to change more than interpretive effect isn’t supported by lit

#### Overlimits---they box out nuanced industry-specific debates and force repetitive, stale, process debates

#### Solves ground---their links are about plan’s effect which our interp solves

#### Functional limits check---few advocates, advantages, and short list of “core” legislation

#### Reasonability best – competing interps cause a race to the bottom and substance crowd-out

## t-private

### Private Sector – 2AC

#### We meet – the plan text specifies the application to the private sector

#### 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.

#### We meet – Parker immunity shields private entities

#### It’s best---

#### Education---scope of state action immunity is vital question in antitrust enforcement---Crane & Sack

#### Aff flex---“expand the scope” massively constrains the aff---innovation prevents a sitting duck for PICs

#### Overlimits---they box out nuanced immunity debates and force repetitive, stale, giant innovation debates

#### Solves ground---stable direction of increasing prohibitions ensures links

#### Functional limits check---few advocates, advantages, and short list of “core” legislation

No link to effects impact – the direct result of the plan is increased prohibitions on private entities by limiting their immunity

They misread the phrase in context – the rez prohibits “practices” those are being done by the private sector even if they’re sanctioned by the public sector

#### Reasonability best – competing interps cause a race to the bottom and substance crowd-out

## distinguish cp

### Distinguish CP – 2AC

#### Perm---do both

#### Perm---do the plan and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Conditionality is a voter---creates time and strategy skews, argumentative irresponsibility---dispo solves

#### PICs are a voter---steals the Aff and shifts debate to trivial details

#### Doesn’t solve or links – our impacts are about general precedent in antitrust – single case doesn’t go far enough

#### Carve-outs cause circuit splits that implode uniformity

Dral 1 – Christy H. Dral, JD at the University of Tennessee and Jerry J. Philips, Professor of Law at the University of Tennessee, Tennessee Law Review, Spring, 68 Tenn. L. Rev. 605, Lexis

With the majority opinion in Morrison, the Supreme Court sent a clear message that Lopez was not an anomaly. Or did it? At this point, it seems apparent that if any message was sent at all, it certainly was not clear. The only obvious message sent out by Lopez and Morrison is that future Commerce Clause cases will be decided under a stricter standard than rational basis, although the Court did not admit that this is what it was doing. After Lopez, lower courts and commentators were pleading for the Supreme Court to take another Commerce Clause case and address the many ambiguities that Lopez created. [112](http://www.lexis.com/research/retrieve?_m=77b9f9af4b8d1c6ad19aed70c3c364b3&csvc=bl&cform=bool&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLzVzz-zSkAk&_md5=81c937de2a5963740a15ed0bc3990d63#n112) The Supreme Court responded to these pleas by taking another Commerce Clause case, Morrison, and deciding it just as ambiguously as they decided Lopez. Now, once again, lower courts are left to decipher an incoherent and unworkable rule under the standards articulated in Lopez and reiterated in Morrison. The inherent problems in the Lopez and Morrison standards make the Rehnquist Court's new Commerce Clause jurisprudence difficult to understand and impossible to apply uniformly or with any predictability. One is left with the deeply disturbing impression, therefore, that future cases can and will be decided under the Commerce Clause according to the unannounced agenda of the court deciding the case. II. THE UNWORKABLE STANDARDS Part of the trouble inherent in the Lopez and Morrison standards arises from the majority's refusal to admit that it is changing the Commerce Clause landscape. With one hand the majority refuses to relinquish the rational basis test, while with the other hand the majority strikes down legislation with  [\*617]  standards that clearly are stricter than rational basis. [113](http://www.lexis.com/research/retrieve?_m=77b9f9af4b8d1c6ad19aed70c3c364b3&csvc=bl&cform=bool&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLzVzz-zSkAk&_md5=81c937de2a5963740a15ed0bc3990d63#n113) At least Justice Thomas is straightforward in his desire to abandon pre-Lopez jurisprudence and unequivocally proclaim a new standard. [114](http://www.lexis.com/research/retrieve?_m=77b9f9af4b8d1c6ad19aed70c3c364b3&csvc=bl&cform=bool&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLzVzz-zSkAk&_md5=81c937de2a5963740a15ed0bc3990d63#n114) While the best choice would be to leave the rational basis review intact and abandon the unworkable standards in Lopez and Morrison, certainly the worst choice is to keep the unworkable standards without clarifying the Court's intent. The confusion that the Supreme Court's ambivalence creates is evident in the struggles of the lower courts as they try to determine how to interpret Lopez and Morrison. For example, in Gibbs v. Babbitt, [115](http://www.lexis.com/research/retrieve?_m=77b9f9af4b8d1c6ad19aed70c3c364b3&csvc=bl&cform=bool&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLzVzz-zSkAk&_md5=81c937de2a5963740a15ed0bc3990d63#n115) a recent Fourth Circuit case upholding federal regulation as valid under the Commerce Clause, the dissent criticized the majority regarding its attitude toward Lopez and Morrison. [116](http://www.lexis.com/research/retrieve?_m=77b9f9af4b8d1c6ad19aed70c3c364b3&csvc=bl&cform=bool&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLzVzz-zSkAk&_md5=81c937de2a5963740a15ed0bc3990d63#n116) The dissent spoke of these two cases as "landmark decisions" deserving great respect. [117](http://www.lexis.com/research/retrieve?_m=77b9f9af4b8d1c6ad19aed70c3c364b3&csvc=bl&cform=bool&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLzVzz-zSkAk&_md5=81c937de2a5963740a15ed0bc3990d63#n117) While any Supreme Court decision deserves respect, the feeling that is evoked from the dissent is almost worshipful. One gets the notion that Judge Luttig was waiting for Lopez for a long time and was extremely annoyed that everyone was not embracing it as a huge limitation on Congressional power under the Commerce Clause. He scolded the majority by saying that had the Supreme Court issued the Fourth Circuit Gibbs opinion, "both Lopez and Morrison would be consigned to aberration." [118](http://www.lexis.com/research/retrieve?_m=77b9f9af4b8d1c6ad19aed70c3c364b3&csvc=bl&cform=bool&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLzVzz-zSkAk&_md5=81c937de2a5963740a15ed0bc3990d63#n118) Yet it is the two opinions themselves, by providing imprecise standards, that allow for them to be so consigned. As Gibbs illustrates, the standard the Supreme Court has elucidated is flawed in that it is subject to manipulations by judges who may or may not want to apply it strictly. [119](http://www.lexis.com/research/retrieve?_m=77b9f9af4b8d1c6ad19aed70c3c364b3&csvc=bl&cform=bool&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLzVzz-zSkAk&_md5=81c937de2a5963740a15ed0bc3990d63#n119) It is likely that situations like Gibbs will be very  [\*618]  common for courts applying Lopez and Morrison. Members of sharply divided courts will be accusing each other of not following the precedent of Lopez when both feel they are following Lopez faithfully. [120](http://www.lexis.com/research/retrieve?_m=77b9f9af4b8d1c6ad19aed70c3c364b3&csvc=bl&cform=bool&_fmtstr=FULL&docnum=1&_startdoc=1&wchp=dGLzVzz-zSkAk&_md5=81c937de2a5963740a15ed0bc3990d63#n120) This result will lead to contention on the bench, confusion among lawyers, and inconsistent results.

## estados

### States CP – Don’t Immunize Private Actors – 2AC

#### Perm --- do both --- shields the link

#### Conditionality is a voter --- creates time and strategy skews, argumentative irresponsibility, and dispo solves their offense

#### State’s fiat is a voter --- contrived, no literature assumes uniformity, not reciprocal, and illogical because no single decision-maker could choose

#### Doesn’t solve federalism – broad Parker precedent is a barrier to effective state regulatory experimentation – Sack and Kobyashi

#### Only federal legal remedies solve – states don’t “immunize” private actors, private actors “claim state action immunity” when sued – failure to explicitly narrow Parker over-immunizes private entities – Weber

## sack CP

### Regulation CP – 2AC

#### Perm – do both – solves the link

#### Doesn’t solve federalism – arg is about Court interpretive precedent on Parker immunity allowing states to experiment – Sack and Kobayashi

#### Doesn’t solve innovation or links to the net benefit – the anticompetitive practice is sanctioned by a specific legal doctrine that allows it – the counterplan leaves immunity in place and, if it’s no longer applied, they link to the net benefit – Crane

#### 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.

#### Conditionality is a voter – creates time and strategy skews, not reciprocal – undermines argument responsibility – dispo solves

## Court Clog – patents impact

### Court Clog – 2AC

#### No link – Parker immunity has narrow applicability – zero evidence it greenlights broad challenges

#### 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

#### Biden FTC thumps – increased general antitrust enforcement coming now

#### 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

#### There’s zero empirical support for the link.

Levy 13 [Marin, Assoc Prof of Law @ Duke, "Judging the Flood of Litigation," https://uchicagolawjournalsmshaytiubv.devcloud.acquia-sites.com/sites/lawreview.uchicago.edu/files/02\_Levy\_0.pdf]

Beginning with the purely empirical component, the preceding discussion reveals that the justices often invoke floodgates arguments without much support for why they believe a large number of cases will come. In Bivens, Justice Blackmun suggested that the Court’s decision would “open[ ] the door for another avalanche of new federal cases” on the theory that “[w]henever a suspect imagines, or chooses to assert, that a Fourth Amendment right has been violated, he will now immediately sue the federal officer in federal court”331 and nothing more. In Solem, Chief Justice Burger claimed that the Court’s decision to hold the petitioner’s sentence unconstitutional would lead to a “flood” of new cases with no additional support.332 Of course, it can be easy to hide one’s claims behind this kind of hyperbole—and there is reason to suspect that parties and justices have invoked this language at times precisely because, in the words of Justice Powell, a “‘floodgates’ argument can be easy to make and difficult to rebut.”333 But if a particular decision is made to avoid an influx of cases that could harm a coordinate branch of government or state court, then it should be based on something more than the suggestion that an “avalanche” or “flood” is imminent. Forecasting the number of cases that will follow a decision is no easy task and may be near impossible in some cases. For example, if one of the justices had been willing to accept the basic principle of President Clinton’s argument in Jones, that justice then would have needed to show why a decision by the Court not to stay civil litigation against the President would “spawn” a host of new litigation334—a particularly difficult undertaking given the sui generis nature of the case. But outside of a unique case such as Jones, we should expect the justices to have some extended discussion about why they think a flood is likely to come. This reasoning could be based on past experience with the same kind of claims, as in Michigan Academy of Family Physicians335 and Skinner,336 or experience with comparable claims, as in Bivens.337 Now to be clear, the point of this prescription is not to encourage the justices to become empiricists (an important caveat given that there will certainly be skepticism about the ability of the Court to make these kinds of forecasts even outside the most challenging cases 338). Rather, the point is that if claims about increases in litigation are to influence at least some decisions, the justices need to provide support for those claims—both for each other and for the public.

### Patents – 2AC

#### Patents tubed and courts not key.

Quinn 19 [Gene; July 9; Patent Attorney and Editor and President & CEO of IP Watchdog, Inc; IP Watchdog, “It May Be Time to Abolish the Federal Circuit,” <https://www.ipwatchdog.com/2019/07/09/may-time-abolish-federal-circuit/id=111122/>]

The state of patent law in America is this: You might as well appeal because if you get lucky and draw the right panel you will win. And like it or not, that is precisely what our patent justice system has become under the Federal Circuit. A crapshoot. And we all know it to be true.

The current state of utter disarray at the Federal Circuit, with panels doing whatever they want, judges not agreeing on anything, and ignoring en banc decisions as if they never happened isn’t what the Federal Circuit is meant to have become. The Federal Circuit is a disaster and the collective unwillingness of the judges to come together is making a mockery of an institution that is a critical piece in the U.S. innovation system. Indeed, the fact that the Federal Circuit is absent and unwilling to provide predictability and certainty, which literally was their only job, is why so many people are turning to Congress to solve the problems of the patent system.

The Federal Circuit is the entity within our system that the patent community has turned to for help since 1982, but they are not present currently. The Federal Circuit is so afraid of being overturned by the Supreme Court that they have lost their ability to distinguish even easily distinguishable cases. After all, Mayo dealt with an exceptionally poor claim where the Supreme Court took a shortcut using 101 instead of using 102 or 103. In Alice, they were told by the patentee’s attorney it was a trivial piece of software that could be coded over a weekend by a college student. These cases are easily distinguishable from any life sciences innovation of consequence or something like artificial intelligence or autonomous driving, for example. Yet, the Federal Circuit has expansively read these cases despite the explicit language of the Supreme Court telling them to narrowly read the cases lest all of patent law would be swallowed.

## BizCon (1NR)

### Econ – 2AC

#### No link – Parker immunity has narrow applicability – zero evidence it broadly collapses certainty

#### Turn – aff reduces harmful state regulation

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.

### Econ – A2: Link – Biz Con – 2AC

#### No impact – Biz con’s irrelevant

Doll 16 – Bob Doll, Chief Equity Strategist at Nuveen Asset Management, “Despite Lackluster Growth, Equities Remain Attractive”, Financial Advisor, 8-9, <http://www.fa-mag.com/news/despite-lackluster-growth--equities-remain-attractive-28409.html>

July’s jobs report confirmed that U.S. economic growth remains on track. 255,000 new jobs were created last month, the unemployment rate remained at 4.9% and average hourly earnings climbed 0.3%.2 These stronger-than-expected results raise the chances of a Fed rate hike before year end. Long-term U.S. growth has been lackluster and will likely remain so. Since the start of the recovery seven years ago, real gross domestic product growth has averaged just over 2%.3 Tailwinds such as the improving labor market and low mortgage rates have been counteracted by headwinds such as low business confidence. We expect these crosscurrents will persist. Nominal growth has been particularly weak this cycle. Compared to previous expansions, nominal growth (which includes the effects of inflation) has been extremely low.3 Since nominal growth is determined by both unit growth and pricing power, this trend has been a primary culprit behind recent weakness in corporate earnings. Increases in government spending are a mixed bag for the economy. After several years of a sequester-enforced decline in spending, government spending has increased in 2016.4 While this boosts economic growth, additional regulations and increased control of private resources through stringent health insurance rules limit the economy’s ability to promote higher standards of living. China’s economy is slowing, but the rate should be manageable. Fears of a Chinese hard landing have been a persistent worry for investors. Chinese authorities have been slowly shifting the country’s economy away from exports and investment spending and toward domestic consumption. We believe Chinese growth is slowing from the officially reported 10% level of a few years ago toward something closer to a more-sustainable 5% by the end of this decade.5 Despite Risks, the Global Economy Remains Resilient Since the current economic recovery began, investors have contended with a number of economic issues. The most recent risk has been the extent to which the Brexit vote might trigger widespread contagion. So far, it appears that outside of slowing growth in the United Kingdom, effects have been limited. Investor worries are now focused on Italy’s banking and political systems. Italian banks are struggling with a rash of bad loans on their balance sheets and thin capital buffers. This storm has been brewing for some time, and coincides with the upcoming constitutional referendum that could reshape Italy’s political system. Investors are rightfully viewing the turmoil with caution. In addition, many are questioning the overall state of the world economy in light of rising geopolitical instability, consternation over the upcoming U.S. elections, questions about global monetary policy, relatively low business confidence and a renewed slump in oil prices. Yet, we believe the global economy has been, and should continue to be, resilient in the face of all of these risks. We believe global monetary policy remains supportive of growth and the global recovery will continue, especially in the United States.

### Econ – Impact– 2AC

#### Collapse doesn’t cause war

Walt 20 [Dr. Stephen M. Walt, Robert and Renée Belfer Professor of International Relations at Harvard University, PhD in International Relations (with Distinction) from Stanford University, MA in Political Science from the University of California, Berkeley, “Will a Global Depression Trigger Another World War?”, Foreign Policy, 5/13/2020, https://foreignpolicy.com/2020/05/13/coronavirus-pandemic-depression-economy-world-war/]

On balance, however, I do not think that even the extraordinary economic conditions we are witnessing today are going to have much impact on the likelihood of war. Why? First of all, if depressions were a powerful cause of war, there would be a lot more of the latter. To take one example, the United States has suffered 40 or more recessions since the country was founded, yet it has fought perhaps 20 interstate wars, most of them unrelated to the state of the economy. To paraphrase the economist Paul Samuelson’s famous quip about the stock market, if recessions were a powerful cause of war, they would have predicted “nine out of the last five (or fewer).”

## Rural hc

### 2ac – link

#### No link – NPs regs are sovereign authority

McMichael 20 [Benjamin J. McMichael, Assistant Professor of Law, University of Alabama School of Law, December, 2020, “Occupational Licensing and the Opioid Crisis” 54 U.C. Davis L. Rev. 887]

[\*941] One way to avoid the political difficulties associated with pursuing NP independence in state capitols would be to pursue this independence via litigation. However, there is no clear path to independence through either the federal or state court systems. As noted above, a strategy of directly litigating the validity of restrictive SOP laws under federal antitrust law will not succeed. 230 The Supreme Court has clearly stated that SOP laws enacted by state legislatures are not subject to federal antitrust scrutiny because they fit squarely within the state-action immunity articulated in Parker v. Brown. 231

[Footnote 231] N.C. State Bd. of Dental Exam'rs v. FTC, 574 U.S. 494, 504 (2015) ("An entity may not invoke Parker immunity unless the actions in question are an exercise of the State's sovereign power. State legislation and "decisions of a state supreme court, acting legislatively rather than judicially,' will satisfy this standard, and " ipso facto are exempt from the operation of the antitrust laws' because they are an undoubted exercise of state sovereign authority." (alteration in original) (citation omitted) (quoting Hoover v. Ronwin, 466 U.S. 558, 567-68 (1984))).

While certain state SOP regulations can face antitrust scrutiny, these regulations are not responsible for the most restrictive elements of state SOP laws - state statutes are. 232 In lieu of pursuing federal challenges to state SOP laws, litigants could opt for challenges in state courts. However, there is no particular reason for optimism on this front, and without a novel theory to challenge these laws, litigation in state courts is not likely to succeed.

#### Turn – solves rural health shortages

McMichael 20 [Benjamin J. McMichael, Assistant Professor of Law, University of Alabama School of Law, December, 2020, “Occupational Licensing and the Opioid Crisis” 54 U.C. Davis L. Rev. 887]

This example illustrates the importance of access to healthcare providers in addition to access to health insurance. 5 And access to providers is far from given, with many areas of the country experiencing shortages of healthcare providers that experts expect to worsen over the next decade. 6 The New York Times example also highlights both a viable policy option to address these shortages - the increased use of NPs to provide care - and an important obstacle to implementing this policy - restrictive laws.

NPs are registered nurses who have undergone additional training to provide healthcare services historically provided by physicians. 7 They represent the principal source of care in many geographic areas 8 and are more likely than physicians to practice in rural and underserved communities. 9 This makes the 200,600 practicing NPs a natural option to address chronic, critical, and worsening physician shortages across the country. 10 While NPs provide healthcare services across the country, their ability to do so is not equal in all areas. State scope-of-practice ("SOP") laws - a subset of the occupational licensing laws that govern NPs and many other professionals - determine what services [\*891] NPs may provide and the conditions under which they may provide those services.

States often justify SOP laws as necessary to ensure patient safety by preventing unqualified individuals from providing care. 11 Though these laws can further this goal, excessively restrictive SOP laws undermine the ability of NPs to care for patients. Prior work has shown that eliminating restrictive SOP laws and allowing NPs to practice independently of physicians can facilitate access to care, 12 improve the quality of care, 13 reduce the use of intensive medical procedures, 14 and reduce the price of some healthcare services. 15 Based on this evidence, the Obama and Trump administrations along with the National Academy of Medicine and other organizations have urged states to relax their SOP laws. 16 A minority of states have responded by granting NPs the authority to practice independently, but the ongoing debate and [\*892] political battle over SOP laws has only intensified over the last decade. 17 Physician organizations, in particular, vigorously oppose the relaxation of these laws and have been successful in discouraging states from granting NPs independence. 18

## Midterms

### MT – Dems Win – 2AC

#### Will retain majority – fundraising outweighs

Schouten 10-15 (Fredreka Schouten, and Alex Rogers, CNN, “Democratic Senate candidates display fundraising might in third quarter,” 10-15-2021, <https://www.cnn.com/2021/10/15/politics/senate-fundraising-third-quarter/index.html>)

Democratic Senate contenders in some of the most competitive races announced big fundraising hauls this week -- as they prepare for a costly battle to preserve their party's razor-thin majority in next year's midterm elections.

Georgia Sen. Raphael Warnock, considered one of the Democrats' most vulnerable incumbents, raised more than $9.5 million during the third quarter of this year, his campaign manager Quentin Fulks announced Friday. Warnock's haul -- one of the largest of any Senate candidate -- far outpaces his best-known Republican rival, former football star Herschel Walker.

Walker raised $3.7 million in five weeks, according to spokeswoman Mallory Blount. Walker entered the race in late August with the encouragement of former President Donald Trump.

Warnock, the state's first Black senator, ended the quarter with more than $17.2 million in available cash remaining in his campaign account -- as he seeks a full, six-year term in the Senate after winning a special election runoff earlier this year.

That's more than any Georgia Senate campaign has ever reported at this stage in the election cycle, Fulks said. Warnock's total was first reported by the Atlanta Journal-Constitution.

In Arizona, Sen. Mark Kelly, another endangered Democrat seeking a full term, brought in $8 million in total receipts during the third quarter, his campaign announced. (The total includes a refund from a campaign vendor.) But he is expected to report nearly $13 million in available cash for what likely will be one of the most expensive Senate contests of the 2022 election cycle.

The midterms are more than a year away, but the stakes are enormous. The ability of President Joe Biden's administration to advance his agenda hinges on whether Democrats can retain control of Congress.

Republicans need a net gain of just one seat to win the Senate majority in 2022. In the House, the GOP will take the majority if they net five seats. In addition, Democrats face the headwinds of history: The party of a first-term president typically loses ground in Congress in midterm elections.

Warnock and Kelly, fresh off recent special election victories, have "solidified their status as fundraising juggernauts," said Nathan Gonzales, editor of Inside Elections. "It's clear they are not going to lose because of lack of resources."

But while "fundraising is important, most strategists would take a favorable political environment over money any day of the week," he added.

Other fundraising standouts in the July-to-September fundraising quarter include Florida Democratic Rep. Val Demings, who is hoping to face Republican Sen. Marco Rubio next fall. She announced bringing in $8.4 million during the third quarter, surpassing the $6 million the Rubio campaign collected during the same period.

In Nevada, another key battleground for control of the Senate, first-term Democratic Sen. Catherine Cortez Masto raised nearly $3.2 million in the fundraising quarter and about $14 million in total this year for her reelection bid. Adam Laxalt, a former Nevada attorney general who entered the race for the Republican nomination in August, raised roughly $1.4 million in his first six weeks as a candidate, according to numbers released earlier this week.

Laxalt has the backing of both Trump and Senate Minority Leader Mitch McConnell, but another Republican, Sam Brown, said he came close to that haul, collecting $1 million.

Other marquee contests

In New Hampshire, first-term Democratic Sen. Maggie Hassan raised nearly $3 million and ended September with roughly $6.5 million in cash reserves, according to her filing with federal regulators. She also spent heavily during the three-month period -- plowing more than $1.5 million into media buys alone, well ahead of next year's general election.

If New Hampshire Gov. Chris Sununu enters the race for the Republican nomination, as expected, the contest is likely to become one of the marquee Senate battles of the cycle.

"Democrats' massive fundraising shows the strength of our candidates' grassroots support, and the enthusiasm that exists for Democrats' work in the Senate," Jazmin Vargas, a spokeswoman for the Democratic Senatorial Campaign Committee, said in a statement to CNN.

### MT – 2AC

#### Antitrust wins are woefully insufficient for midterm gains – their ev’s old, and the warrant is that it’d be popular with Dem progressives – who do NOT matter at all in the Senate races Dems need to gain seats – it CANNOT pick up the centrist GOP votes that are the only ones that matter

Gonzales 21 (Nathan L. Gonzales, senior political analyst for the Public Affairs Council and editor of Inside Elections, “Midterm Election Scenarios Are Not Created Equal,” Public Affairs Council, September 2021, https://pac.org/impact/midterm-election-scenarios-not-created-equal)

Right now, this is easily the least likely scenario for 2022: Democrats expanding their House and Senate majorities.

Not only would the country need to be fundamentally healthier — physically, economically, socially, mentally — but a large swath of voters would need to give Biden credit for the rebound.

In this politically charged environment, Republicans aren’t likely to give Biden any successes. Even if COVID-19 becomes more of a hassle than a threat, Republicans will still complain about government overreach on mandates or shift back to complaints about critical race theory, border security, urban crime, socialism, Marxism, communism or anything else to make their case for change. And the country has become so polarized that I don’t think Biden would benefit from the rally ’round the flag effect if the country is met with an outside threat.

An energized GOP base limits Democratic opportunities. On a macro level, if GOP voters lose energy or distrust the entire voting system to the point of inactivity, then Democrats gain by Republicans not voting at all. On a micro level, Republicans would have to completely botch their redistricting opportunities and nominate the worst possible Senate candidates.

In this scenario, Democrats would gain House and Senate seats, which has happened just twice for the party in the White House in midterms in the past century. The midterm elections would probably have to evolve into a referendum on Trump, the Jan. 6 insurrection, and QAnon for this to transpire, and Biden’s job rating would need to skyrocket. It’s very hard to see it all unfolding this way at this point.

#### Inevitable passage of something in the infrastructure AND/OR reconciliation category obviously solves – questions of watering down are irrelevant given the law threshold they’ve established

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

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

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

#### Elections disad is a lie – impossible to predict outcomes and plan’s irrelevant

Bacon 10-7 [Perry Bacon Jr. is a Washington Post columnist 10-7-2021 https://www.washingtonpost.com/opinions/2021/10/07/perry-bacon-america-election-obsession/]

Every day is not Election Day. Most days are not Election Day. Most of what happens in the years between elections won’t affect what happens on Election Day. Yet the United States’ political culture has become singularly obsessed with elections, directing us away from important debates about issues and turning every question into an analysis of Wisconsin swing voters.

Of course elections matter, because they decide who gets to set policy. And with the Republican Party becoming more authoritarian by the day, state and federal elections matter especially now. If the GOP wins enough state legislative, gubernatorial and congressional races over the next few years, it may well use gerrymandering, voting-law changes and other moves to create entrenched one-party rule.

And perhaps because of the radicalism on the right, I am seeing a rise in political discussions framed around elections, from not only politicians and activists but ordinary citizens, particularly Democrats. Read political reporting, scroll Twitter or watch cable news, and you’ll notice that much discourse ostensibly about, say, the infrastructure bill, Afghanistan or President Biden is really focused on one all-consuming question: “How will this affect what swing voters in Wisconsin — or Pennsylvania, or Arizona — do in 2022 and 2024?”

Given the high stakes, the obsession is understandable. Nonetheless, it’s a bad development. Why?

First, some ideas deserve a hearing, even if they are unpopular. The civil rights movement of the 1960s could not have survived a daily analysis of how it affected the Democrats’ standing in swing states — the March on Washington was unpopular when it happened, as was the Rev. Martin Luther King Jr. at times. Today, it makes sense that the Republican policymakers keep pushing abortion limits — they believe that is the moral position and are willing to absorb some electoral heat for it. (And it might not be that much heat.)

On the Democratic side, defending the rights of immigrants and Black people may never be particularly popular, and I am not arguing that Biden should completely ignore electoral consequences and propose a major reparations program next week. But Biden generally should not act in morally dubious ways on racial issues simply to woo conservative White voters, not only because such actions would be wrong but also because there is limited evidence this would actually win him many White swing voters.

Second, debating on electoral terms can prevent important discussions about the substance of politics. “What should be in the reconciliation bill?” would be a more useful question to explore with the public and Democratic officials than “What are the electoral effects of passing or not passing the reconciliation bill?”

Third, if we knew the precise electoral effects of passing those bills (or most other things that happen in politics), those effects would be important to talk about. But the truth is we don’t.

Here’s what we really know: Most Americans will vote for the party they normally do. Voters don’t know much about policy details but have some generic predispositions that are heavily shaped by their ideology and media coverage. There is a small group of voters who don’t pay that much attention to politics who swing between the parties and/or vote in some elections but not others. The president’s party generally does worse in midterm elections and when he has a low approval rating.

That isn’t much to work with. Nonetheless, a whole class of elected officials, strategists, pundits and others constantly make confident claims. More conservative Democrats are arguing that the party will suffer electorally if it doesn’t pass an infrastructure bill as soon as possible, while more progressive Democrats argue that it will suffer if it doesn’t pass the reconciliation bill they favor. Democrats on neither side of this ideological divide argue that the party must pass something or voters will punish them next year. And Republicans confidently say that the Democrats will lose in 2022 if they push through the bills.

All of these arguments are at best overconfident and might be more accurately described as nonsense. There is little evidence that most voters carefully track the legislative success of a political party and vote accordingly — and undecided and intermittent voters know even less about what’s happening in Washington.

Similarly, it’s unlikely that the Democrats making slight moves to the right on racial issues will affect voters’ broader perceptions of the GOP as the party that is conservative on race and of the Democrats as liberal on those issues. I would bet that Republicans win the major statewide races in Texas next year despite the unpopularity of its recent abortion law — and my guess is most of the Democrats crowing about how that law will boost them electorally would bet on the Republicans, too.

I know that politicians have long used polling to inform their decisions. I know that the complaint that American politics is now a “permanent campaign” is not new. And I actually think it’s useful to know where the public stands on issues, because the government generally shouldn’t take actions that only a small minority of the public supports.

But the problem isn’t really polling. Rather, it’s the use of polls to center everything that happens in politics around those November 2022 swing voters in Wisconsin. We can have election month, maybe even election season, but when every day is Election Day, we are robbing our politics of real, substantive debates to instead concentrate on possible electoral outcomes that we can’t predict or control anyway.

# 1ar

## Rural

#### 1. Rural health suffers from physician shortage

Cryts 16 [Aine Cryts, healthcare correspondent. “Rural areas continue to be hit hard by primary care physician shortage”. January 19, 2016. <https://www.fiercehealthcare.com/practices/rural-areas-continue-to-be-hit-hard-by-primary-care-physician-shortage>]

Americans living in the most rural areas of the country continue to lack access to primary care clinicians, with nurse practitioners far more likely to serve these areas, according a recent study published in Medical Care. In states that haven't expanded Medicaid access, residents experience even greater challenges accessing primary care within their geographic area.

"The most rural areas of the country averaged nearly 357 uninsured people per primary care clinician compared to only 133 uninsured people per clinician in large urban areas," wrote lead study author John Graves, Ph.D., a healthcare economist at Vanderbilt University, in a study announcement.

Researchers found that while physicians were more likely to provide primary care than nurse practitioners or physician assistants, most physicians were likely to practice in urban areas. Nurse practitioners were relatively more likely to deliver care in rural areas, according to researchers.

In a related finding, an individual state's scope-of-practice laws--which limit the responsibilities of nurse practitioners and physician assistants--seemed to have a negative impact on rural residents' access to primary care.

#### There’s a ripple effect---shortages collapse other rural infrastructures

Zach 16 [Elizabeth Zach, Zach is a staff writer at the Rural Community Assistance Corporation, 9-5-2016, "What hospital closures mean for rural California," High Country News, http://www.hcn.org/issues/48.15/what-hospital-closures-mean-for-rural-california]

The lack of a hospital or major health center can create a domino effect: Doctors don’t move in, hospitals are short-staffed and underfunded, and potential residents and businesses are discouraged from relocating by the lack of nearby health care. All of this affects the local economy. “Hospitals are large demanders of labor,” said Cristina Miller, an economist with the U.S. Department of Agriculture’s Economic Research Service, who has studied rural health care. “They offer local jobs, both for high- and low-skilled workers, everything from the obvious, like nursing, to janitorial to maintenance. An employee buys a house in the area, brings their family with them and demands public goods. Their kids will go to school there, they’ll buy gas and food there, money circulates. The idea is that there is spillover.” Even if the hospitals in the Central Valley were to reopen, or a regional hospital was built to serve the area, attracting and retaining doctors would be difficult. There is more money to be earned in urban areas, and some doctors perceive small towns as offering a constricted social life. Marie-Elizabeth Ramas was one of those who gave it a try. Until April, when she announced she was leaving, she was the medical director at the Mercy Community Rural Health Clinic, which focuses on uninsured, low-income families around Mount Shasta, a small town of 3,300 in Northern California. Ramas is a soft-spoken African-American woman, who graduated from medical school in 2008 and went on to receive a National Health Service Corps scholarship for her commitment to primary care in underserved communities. She initially imagined that being a rural physician would give her more time to spend with her family. Instead, she felt stretched thin. “I was essentially on call 24/7, because of inefficiencies in the electronic record-keeping system, often spending 10 hours per weekend just catching up and making sure patients were safe,” she said. “I think that if the model doesn’t change, there just won’t be a health system in Mount Shasta, and that would devastate the community.” In fact, there are few models that seem to work. The old ideal of the country doctor who carries a little black bag from house to house was buried under the fear of malpractice suits and insurance restrictions. And telemedicine, another potential solution, is not a cure-all.

#### 2. Physician shortages are increasing in rural areas – state regulation blocks NP practice there

McMichael 20 [Benjamin J. McMichael, Assistant Professor of Law, University of Alabama School of Law, December, 2020, “Occupational Licensing and the Opioid Crisis” 54 U.C. Davis L. Rev. 887]

Relative to physicians, NPs more often choose to practice in primary care and to care for underserved populations, including Medicaid patients. 36 They also provide care in rural or underserved areas to a [\*896] greater extent than physicians. 37 The predilection of NPs to practice in isolated areas and care for patients who have difficulty accessing care is particularly important in an era of worsening physician shortages. For example, the Association of American Medical Colleges estimates that, by 2032, the United States will face a physician shortage of between 46,900 and 121,900. 38 Such a shortage has implications for the country generally, but it will impact rural areas to a greater degree. Recent estimates suggest that the number of physicians practicing in these areas could decline by 23% by 2030. 39 With approximately 200,600 NPs delivering care in 2019 40 NPs can alleviate physician shortages in rural and other areas. Indeed, NPs outnumber primary care physicians, 41 practice in convenient locations like retail and urgent care clinics, 42 and represent the principal source of healthcare in many parts of the country. 43

However, the ability of NPs to function as the principal source of healthcare depends heavily on the SOP laws in place. Prior work has [\*897] classified NP SOP laws in slightly different ways. 44 Each classification system has advantages and disadvantages, but I adopt a classification scheme based on two recent studies that that focus on specific statutory and regulatory language. 45 Where necessary, I updated the classifications based on more recent statutory and regulatory information. This approach to classification eliminates the risk of mis-classification that can occur by relying on inconsistent secondary sources. It also isolates the specific statutes and regulations that policymakers may change to achieve specific results in their healthcare systems. 46

#### A. NPs reduce costs

McMichael 20 [Benjamin J. McMichael, Assistant Professor of Law, University of Alabama School of Law, December, 2020, “Occupational Licensing and the Opioid Crisis” 54 U.C. Davis L. Rev. 887]

On the other side of the debate, opponents of NP independence can point to some evidence that NPs and SOP laws allowing them to practice independently may increase healthcare costs. In a recent report, the [\*904] Medicare Payment Advisory Commission ("MedPAC") highlighted several studies finding that NPs tend to increase costs. 83 One study found that NPs utilized more healthcare resources in caring for patients than physicians, suggesting that more extensive use of NPs may increase costs. 84 A separate study found that NPs order more medical imaging services than physicians in primary care settings. 85 Medical imaging, such as magnetic resonance imaging ("MRI") and computed tomography ("CT") scans can be expensive, so this study suggests that NP independence may increase costs over time. More recent work that examines a larger population contradicts these results, however. Examining data on Medicare and commercial insurance claims, a 2017 study found that NP independence does not result in more medical imaging and does not increase healthcare costs. 86 Similarly, research conducted by economists at the Federal Trade Commission ("FTC") revealed no evidence that relaxing NP SOP laws increases healthcare costs or prices. 87 Overall, a growing body of research suggests that allowing NPs to practice independently can reduce costs and the prices patients must pay for care, while only a few studies have found evidence to the contrary. 88

#### B. Quality of care – Best studies are aff

McMichael 20 [Benjamin J. McMichael, Assistant Professor of Law, University of Alabama School of Law, December, 2020, “Occupational Licensing and the Opioid Crisis” 54 U.C. Davis L. Rev. 887]

Perhaps the most contentious point in the debate over NP SOP laws concerns the ability of NPs to deliver high-quality care without physician oversight. Opponents of NP independence generally argue that, without physician supervision, NPs cannot safely care for patients. For example, the California Medical Association has stated that it "opposes any attempts to remove physician oversight over [NPs] and believes that doing so would put the health and safety of patients at risk." 54 Some groups frame their arguments about quality of care in [\*900] terms of the different levels of education completed by NPs and physicians. 55 These arguments require the additional inferential step that more education is required to provide the type of care delivered by NPs, but they are effectively equivalent to statements that unsupervised NPs cannot safely care for patients. 56

Advocates of greater NP autonomy respond to these arguments by pointing to the available evidence that demonstrates NPs generally deliver care of comparable quality to that delivered by physicians. 57 Multiple studies have investigated the ability of NPs to deliver high-quality care, often comparing NP-supplied care to physician-supplied care. 58 A recent comprehensive analysis compared the quality of care delivered to Medicare beneficiaries by NPs and physicians and found that physicians perform better on certain quality measures and NPs perform better on other measures. 59 Related work has found no meaningful differences between NPs and physicians in caring for HIV [\*901] patients, 60 managing diabetes, 61 providing primary care, 62 prescribing medications, 63 or providing critical care. 64 Reviewing the evidence, the National Academy of Medicine concluded "that access to quality care can be greatly expanded by increasing the use of ... [NPs] in primary, chronic, and transitional care." 65

Opponents of broader NP SOP laws have criticized this evidence as irrelevant because these studies are often "performed in a setting of physician oversight and collaboration." 66 They argue that "using data from studies of nurse practitioners working under physician supervision to demand independent practice is a flawed practice, as there is no proof that nurse practitioner care without physician oversight is either safe or effective." 67 However, studies that have explicitly examined the role of relaxing NP SOP laws - as opposed to the role of NPs generally - in promoting the delivery of high-quality care have concluded that NP independence either improves or has little effect on the quality of care delivered.

A 2017 study found that NP "independence had no statistically significant effect on any of the three [clinically verified indicators of [\*902] healthcare quality] studied." 68 In contrast to claims that NP SOP laws are necessary for the protection of patients, 69 this study "did not substantiate the use of [SOP] restrictions for the sole purpose of consumer protection." 70 A separate study "cast[] further doubt on the theory that state regulations limiting NPs practice are associated with quality of care." 71 Examining patient-reported quality across many years of a nationally representative dataset, a recent study found that NP independence increases the probability that patients report being in excellent health. 72 Another study found that NP independence had no effect on infant mortality rates, an important indicator of healthcare quality. 73

Overall, existing evidence does not support the contention that unsupervised NPs provide unsafe or low-quality care. To be sure, physician groups are correct in their assertion that NPs are not trained to provide the same range of services as physicians - NPs do not perform surgery, for example. Within the scope of their training, however, the evidence demonstrates that NPs perform similarly to physicians.

#### Quality and tailoring are key to rural AG – our link turn outweighs

Masterson 17 (Kathleen, VPR's New England News Collaborative reporter, “Health Insurance Woes Add To The Risky Business Of Farming” <https://www.npr.org/sections/thesalt/2017/02/21/515196225/health-insurance-woes-add-to-the-risky-business-of-farming> )

A University of Vermont researcher found that nationally, most farmers cited health care costs as a top concern.

Shoshanah Inwood is a rural sociologist at UVM. She has been studying the aging and shrinking farm population, and what components are needed to build a prosperous farm economy.

Inwood says she hadn't thought about health care in particular as a factor until she conducted an unrelated survey in 2007 of farmers working the land in areas facing population growth and development pressures. The survey asked, "What are the issues affecting the future of your farm?"

"And we assumed when we got that survey back, we would get things like the cost of land, the cost of inputs, neighbors. The number one issue facing farmers was the cost of health insurance. They identified that as the biggest threat to their farm," she said.

Inwood says this held true for small and large farms: Two-thirds of commercial farmers cited the cost of health insurance as the biggest threat.

Typically, strategies to build a robust farming industry have focused on access to land, capital and changes to market infrastructure.

"But then you ask people, 'Well, how many people know a farmer that has an injury? Or a farm family that has a chronic health issue? Or a mental health issue?' And everybody's hand goes up," Inwood said. "And that's the one issue we really never talk about, are some of those social needs that farm families have."

## Biz Con

### Econ – A2: Link – A2: Abbott

#### Abbott abruptness link is solved – Biden’s XO signaled a limit to Parker immunity

#### And – it’s about rulemaking happening in the squo

FYI. MSU = Blue.

Abbott ’21 [Alden; February 2021; Senior Research Fellow at the Mercatus Center of George Mason University, J.D. from Harvard Law School and M.A. in Economics from Georgetown University; Concurrences, “Competition Policy Challenges for a New U.S. Administration: Is the Past Prologue?” <https://www.concurrences.com/en/review/issues/no-1-2021/on-topic/the-new-us-antitrust-administration-en>]

12. But recent suggestions put forth in an October 2020 House Judiciary Subcommittee on Antitrust majority report (HJSMR) [[12](https://www.concurrences.com/en/review/issues/no-1-2021/on-topic/the-new-us-antitrust-administration-en#nb12)] and in a November 2020 report by the Washington Center for Equitable Growth (WCEGR) [[13](https://www.concurrences.com/en/review/issues/no-1-2021/on-topic/the-new-us-antitrust-administration-en#nb13)] (coauthored by various prominent critics of Trump administration antitrust enforcement who served in the Obama administration) would go far beyond application of existing antitrust law to big digital platforms. In particular, the HJSMR proposes taking a highly regulatory approach to digital platforms, including imposing “[s]tructural separations and prohibitions of certain dominant platforms from operating in adjacent lines of business.” [[14](https://www.concurrences.com/en/review/issues/no-1-2021/on-topic/the-new-us-antitrust-administration-en#nb14)] The WCEGR also endorses the use of rulemaking (and, in particular, FTC rulemaking) to tackle significant problems of competition. [[15](https://www.concurrences.com/en/review/issues/no-1-2021/on-topic/the-new-us-antitrust-administration-en#nb15)] Rushing into rulemakings on platforms (especially without a clear showing of market failure) poses major risks, however, including, in particular, the creation of disincentives to invest in platform-specific innovation; and the interference with potential efficiency-seeking transactions by platform operators and suppliers of complements (in light of inevitable government second-guessing of platform-related business decision-making). The JBA antitrust team may wish to keep such potential costs in mind in setting competition policy vis-à-vis digital platforms.

13. To address the perceived growth and abuse of market power that are said to afflict the American economy, the HJSMR and WCEGR have also proposed to amend and thereby “toughen” the core antitrust statutes, to alter burdens of proof in litigation, and to bestow a substantial increase in resources on federal antitrust enforcers. [[16](https://www.concurrences.com/en/review/issues/no-1-2021/on-topic/the-new-us-antitrust-administration-en#nb16)] The problem of scarce agency resources has long been highlighted by enforcement agency leadership, and certainly merits attention. The call for dramatic systemic change in antitrust enforcement norms, however, should be approached cautiously, with a jaundiced eye. In our common-law-based antitrust system, a major disruption to long-familiar statutory schemes would generate major uncertainty regarding antitrust enforcement principles and substantially disrupt business planning for an indeterminate amount of time. Many welfare-enhancing transactions could be sacrificed. The harm to consumer and producer welfare due to lost socially beneficial business initiatives would be hard (if not impossible) to measure, but nonetheless real. It is certainly possible that such losses would outweigh (perhaps substantially) whatever welfare gains might flow from statutory enforcement “reform.” In other words, it should not casually be assumed that “more and different” antitrust would be an unalloyed benefit. As in all other areas of law enforcement, likely costs as well as purported benefits should be central to the antitrust public policy calculus. (Costs would include, of course, the likelihood and magnitude of “false positives” under the new enforcement regime, not just the reduction in socially beneficial transactions.)

### Econ – A2: Link – A2: Keating

#### No link to Keating – it’s about massive “Big Tech” enforcement and the squo

FYI. MSU = Blue.

Keating ’21 [Raymond; June 18; Chief Economics for the Small Business and Entrepreneurship Council and Adjunct Professor in the MBA Program at the Townsend School of Business at Dowling College; SBE Council, “Antitrust Fictions (and Actions) Will Have Real, Negative Economic Consequences,” <https://sbecouncil.org/2021/06/18/antitrust-fictions-and-actions-will-have-real-negative-economic-consequences/>]

The Real Outcome: Less Competition and Innovation, Fewer Choices, Diminished Investment and Entrepreneurially Opportunity

It needs to be understood that while supposedly targeting so-called “Big Tech,” these intrusive regulations and substantial costs would fall on competitors as well, thereby actually discouraging competition in technology markets. For good measure, moving ahead with his kind of hyper-antitrust regulation of tech firms lays the groundwork for doing so in other industries, such as in retail, energy, health and medical sectors, and so on. This is what Senate anti-trust crusaders hope to accomplish.

The message is clear: Beware entrepreneurs, businesses and investors if you become too successful or if you cross certain political constituencies. The government stands ready to punish you via intrusive and costly regulation.

It doesn’t matter that this entire attack on “Big Tech” is based on political fictions, as the policies would generate negative economic consequences. Political, antitrust fictions do not somehow make the fallout for entrepreneurship, investment and innovation any less real.

### Econ – A2: Link – A2: Thierer

#### Thierer is about squo tech regulation and M&A standards being interpreted broadly and upsetting settled law – NC Dental proves that not true in this context

FYI. MSU = Blue.

Thierer ’21 [Adam; February 25; Senior Research Fellow with the Mercatus Center at George Mason University; The Hill, “Open-ended antitrust is an innovation killer,” <https://thehill.com/opinion/technology/540391-open-ended-antitrust-is-an-innovation-killer>]

Unfortunately, the calls for more bureaucracy and regulation emanating from all corners of the political world could have an unintended consequence: discouraging the sort of vibrant innovation and consumer choice that made America’s tech companies household names across the globe.

Sen. [Amy Klobuchar](https://thehill.com/people/amy-klobuchar) (D-Minn.) is leading one charge. Klobuchar, who chairs the Judiciary Subcommittee on Antitrust, Competition Policy and Consumer Rights, [recently introduced](https://www.klobuchar.senate.gov/public/_cache/files/e/1/e171ac94-edaf-42bc-95ba-85c985a89200/375AF2AEA4F2AF97FB96DBC6A2A839F9.sil21191.pdf) the “Competition and Antitrust Law Enforcement Reform Act.” This sweeping measure seeks to expand the powers and budgets of antitrust regulators at the Federal Trade Commission and the Department of Justice. It also includes new filing requirements and potentially hefty civil fines.

The most important feature is the proposed change to the legal standard by which regulators approve business deals. It would allow the government to stop any deal that creates an “appreciable risk of materially lessening competition,” and it also defines exclusionary behavior as, “conduct that materially disadvantages one or more actual or potential competitors.”

These may sound like simple, semantic tweaks, but – much like some of the other policy ideas currently circulating – they would upend decades of settled law and create a sea change in U.S. antitrust enforcement. This change could undermine business dynamism, innovation and investment in ways that inhibit the global competitiveness of U.S. businesses.

Critics of merger and acquisition (M&A) activity by large tech firms include not only Sen. Klobuchar but also Republicans such as Sen. [Josh Hawley](https://thehill.com/people/joshua-josh-hawley) (R-Mo.). Hawley recent [offered an amendment](https://www.axios.com/josh-hawley-big-tech-merger-ban-1467081d-216c-45a2-9d09-9416dfbde330.html) to a budget bill that would preemptively prohibit mergers and acquisitions by dominant online firms. Klobuchar and Hawley believe that M&A skews the market in favor of today’s largest firms, entrenching their market power and discouraging innovation.

History teaches a different lesson. Consider DirecTV and Skype, both once considered innovative market leaders in their respective fields of satellite TV and internet telephony. Both firms stumbled, however, and they might not even be with us today without creative business deals. DirecTV has been partially or fully controlled by Hughes Electronics, News Corp., Liberty Media and now AT&T. Skype has swapped hands multiple times, moving from eBay, to a private investment firm and now to Microsoft.

These were complex deals, and some didn’t work, leading to divestitures. But each was a learning experience that illustrated how dynamic media and technology markets can be with firms constantly searching for value-added arrangements that serve their customers and shareholders. If we make this type of activity presumptively illegal, we’re imagining that government bureaucrats are better suited to make these calls than businesspeople and the consumers who choose whether or not to buy the product.

Worse yet, legal tests like those Klobuchar proposes – “conduct that materially disadvantages potential competitors” – are remarkably open-ended and could be easily abused. The system will be gamed by opponents of deals for business reasons. They will claim that their own failure to attract investors or customers must all be the fault of more creative rivals. That’s a recipe for cronyism and economic stagnation.

Those who worry about today’s largest tech giants becoming supposedly unassailable monopolies should consider how similar fears were expressed not so long ago about other tech titans, many of which we laugh about today. Just 14 years ago, headlines [proclaimed](https://www.technewsworld.com/story/55185.html) that “MySpace Is a Natural Monopoly,” and [asked](https://www.theguardian.com/technology/2007/feb/08/business.comment), “Will MySpace Ever Lose Its Monopoly?” We all know how that “monopoly” ceased to exist.

At the same time, pundits [insisted](https://www.marketwatch.com/story/apple-should-pull-the-plug-on-the-iphone) “Apple should pull the plug on the iPhone,” since “there is no likelihood that Apple can be successful in a business this competitive.” The smartphone market of that era was viewed as completely under the control of BlackBerry, Palm, Motorola and Nokia. A few years prior to that, critics lambasted the merger of AOL and TimeWarner as a new [corporate “Big Brother”](http://www.ojr.org/ojr/workplace/1017966109.php?__cf_chl_jschl_tk__=67a5f6a101935b8e3586ca48216d31ba6d4e03de-1612467283-0-AXvbGCtUx-p_N4T-8_2m8OHezQUhQ9kelg9-pVuD6IzKvFfXrllJujU9ERvjqjyIsAeCovUw9bfZqq75_NYasBM87SnQT_027hDJOhjXeowzK1QQH_7vcmr1tS4XgCGC_NNx6UGbAvVgcJNFhSkqkVKKeRJ-BjdDA7Vus-gwmr7wQXcS7KKfTtHyqxdRfureL9alpZHU2IJcbbdYaZpTjTrfcJHCKa8pIZcdiScjaRJmON9X1Ip20Vuv7tyDHbZSvcrn88WrY_9N_qBpKvZhQ4PAe90w5Fx5iHjjNIzoNMKSpToTFGLbPdqawgge9PVubSQbkS7xXDXxCBMA2Sh-Y_U) that would decimate digital diversity and online competition.

Today, we know these tales of the apocalypse ended up instead becoming case studies in the continuing power of “creative destruction.” New innovations and players emerged from many unexpected quarters, decimating whatever dreams of continued domination the old giants once had.

Today’s biggest players face similar pressures, and it’s better to let rivalry and innovation emerge organically, not through the wrecking ball of heavy-handed antitrust regulation.

### Econ – A2: Link – A2: Mitchell\*

#### No take-backs – your 1NC Mitchell card is 100% about the status quo threat of enforcement – makes the DA inevitable

FYI. MSU = Blue.

Mitchell ’21 [Trace; March 3; Research Associate at the Mercatus Center at George Mason University, J.D. from George Mason University; Morning Consult, “Weaponizing Antitrust to Attack Big Tech Is a Bad Idea,” <https://morningconsult.com/opinions/weaponizing-antitrust-to-attack-big-tech-is-a-bad-idea/>]

From the House Judiciary report calling for dramatic antitrust reform to federal antitrust regulators and state attorneys general initiating lawsuits against Facebook and Google, government officials are once again calling for more aggressive antitrust enforcement to go after America’s tech businesses.

And while critics from all sides are reaching for any and all tools to go after “Big Tech,” weaponizing antitrust will only end up harming American consumers and the American economy at a time when we’re still trying to keep our heads above water.

Using antitrust to go after American tech won’t stop at Silicon Valley. Every sector of our economy will be at risk of politically motivated antitrust enforcement. And that won’t just hurt consumers searching for information on Google or shopping for products on Amazon — America’s economy could lose its global competitiveness amid a global pandemic.

In fact, the recent cases against [Google](https://www.justice.gov/opa/pr/justice-department-sues-monopolist-google-violating-antitrust-laws) from the Department of Justice and state attorneys general are a great example of just how this misuse of antitrust could harm Americans across the country and halt innovation in its tracks.

These suits conveniently forget how consumers benefit from Google’s suite of products in attempts to claim that Google unfairly monopolized the search and search advertising markets. Even worse, by claiming consumer harm, the government fails to truly grasp what consumers actually want.

You see, under the consumer welfare standard, antitrust enforcement is built to focus on what consumers want and whether consumers benefit. When the government argues Google is harming Americans because its products are preinstalled and even the default search engine on Apple, the government forgets that American consumers don’t think this is a problem.

The [vast majority](https://www.businessinsider.com/how-google-retains-more-than-90-of-market-share-2018-4) of search users prefer Google to its competitors. And through preinstallation, we get free-to-use products, quick searches and near-limitless information in an integrated system with the click of a mouse. It isn’t a problem; it’s a time saver. Further, because Google can reinvest in developing more user-friendly tech in a preinstalled ecosystem, we get interoperable apps that make our experience that much more convenient and intuitive. And even if consumers do want a different app, they can fix this problem with no heavy leg work or travel — just the swipe of a finger.

But if the government gets its way, the message could be disastrous for innovation: Even if your business benefits Americans and improves the user experience, the government can still put a target on your back. Not to mention, the government would be more likely to put a target on your back if you’re large and politically disfavored. Consumers across the internet and the American economy would be hurt and left without more accessible and more affordable technology as options.

We should be working to reward, not punish, innovation. Otherwise, the next Google may just decide it isn’t worth the time and effort.

Similarly, the Federal Trade Commission’s recent case against Facebook also puts the wants of policymakers above the actual interests of consumers.

Here, the government claims that Facebook harms consumers by acquiring and then integrating services like Instagram and WhatsApp. So harmful, the Federal Trade Commission says, that Facebook must divest from these services, even if that would harm American consumers, innovation and entrepreneurship for decades to come.

But this is not a case of consumer harm or bad behavior — Facebook’s acquisition of Instagram and WhatsApp helped ensure that consumers’ desires were prioritized. Through millions of investment dollars into research and development, Facebook turned good services into great services that consumers actively keep coming back to.

Through relentless product improvement, WhatsApp became a free-to-use platform and Instagram became one of the most successful photo-sharing social media apps in the world. In both cases, consumers benefited from convenient and state-of-the-art advancements. No longer do we have to pay to use messaging or search through multiple results to shop our influencer feed.

As it stands, the Federal Trade Commission case could splinter one successful tech company into multiple, less efficient organizations, setting a precedent that could affect every American industry. Consumers would not only lose Facebook’s free-to-use services but also potentially the next big clothing brand or the next hit microbrewed beer.

By impeding mergers, the sheer fear of potential antitrust enforcement would shutter the doors on small businesses from all sectors of the economy. So much investment in innovation is built on the possibility of being acquired by a larger player. Entrepreneurs and innovators from manufacturing, automotive and tech alike would be left with an unfortunate takeaway — succeed and benefit consumers, but not too much.

And with an economy still struggling to recover, the absolute last thing we need is to leave consumers without innovative and affordable choices, small businesses without key investment opportunities and our economy without a competitive edge globally.

But by weaponizing antitrust, we’ll get neither thoughtful intervention nor consumer benefits. Instead, the United States will lose ground to foreign competitors and American consumers will ultimately pay the price.

### No impact

#### No collapse – other countries fill in and IMF and fed can bailout

#### Econ’s resilient

Palha 17 – Sol Palha, Head Financial Analyst at Tactical Investor, Writer at The Street, Contributor at Huffington Post, Master’s Degree in Psychology from Columbia University, Lecturer at Pasiad International, “Is A Spectacular Stock Market Crash Just Around the Corner?”, 2017, http://www.huffingtonpost.com/entry/is-a-spectacular-stock-market-crash-just-around-the\_us\_599dbd8fe4b056057bddd035

The stock market crash story is getting boring and annoying to a large degree. Since 2009, there has been a constant drumbeat of the market is going to crash stories. In 2009, many experts felt that the market had rallied too strongly and that it needed to pull back sharply before moving higher up. They were calling for 15%-20% correction. Ten years later and most of them are still waiting for this so-called crash. A stock market crash is a possibility but the possibility is not the same thing as certainty, and this is what seems to elude most of the naysayers. One day they will get it right as even a broken clock is correct twice a day. In the interim waiting for this stock market crash has cost these experts a fortune, both in lost capital gains and actual booked losses if they shorted this market.

It’s 2017, and the markets are overbought, and we agree that they need to let out some steam, but as for a crash that will only occur when sentiment turns bullish. The crowd has not embraced this market and until they do corrections but not crashes is what we should expect. In fact, we penned an article titled “Dow Could Trade to 30K But not before This Happens”, where we discussed the possibility of the Dow trading to 30k before it crashes. The one factor that could alter this outlook would be for the masses to turn bullish suddenly.

This market will experience a spectacular crash one day; nothing can trend upwards forever and eventually the market has to revert to the mean. Markets never crash on a sour note; the crowd is chanting in joy when the markets suddenly change direction. A simple look at previous bubbles will prove this; the housing bubble, for example, did not end on a note of fear; the crowd was ecstatic. Even the Tulip bubble that lasted from 1634-1637 ended on a note of extreme joy.

Jim Rogers states that the next crash will be the worst one we have seen in our lifetimes.

We’ve had financial problems in America — let’s use America — every four to seven years, since the beginning of the republic. Well, it’s been over eight since the last one. This is the longest or second-longest in recorded history, so it’s coming. And the next time it comes — you know, in 2008, we had a problem because of debt. Henry, the debt now, that debt is nothing compared to what’s happening now.

In 2008, the Chinese had a lot of money saved for a rainy day. It started raining. They started spending the money. Now even the Chinese have debt, and the debt is much higher. The federal reserves, the central bank in America, the balance sheet is up over five times since 2008. It’s going to be the worst in your lifetime — my lifetime too. Be worried Business Insider

In a broad manner of speaking, he is right, but the proverbial question as always is “when”; so far the naysayers have missed the mark by 1000 miles. This entire rally has been based on the fact that the Fed artificially propped the markets by keeping rates low for an insanely long period and infusing billions of dollars into the markets. One day the pied piper is going to collect but as we have stated over and over again over the years, that until the masses embrace this market, a crash is unlikely. A strong correction is, however, a certainty; it’s just a matter of time.

The market has defied every call, and even some of the most ardent of bulls are now nervous; we stated this would occur over two years ago. The Market has put in over 36 new highs this year and is living up to the new name we gave it late in 2016. Up to that point, we referred to this market as the most hated bull market of all time; after that, we started to refer to this market as the most Insane Stock Market Bull of all time. Insanity by definition has no pattern so expect this market to do things no other market has ever done before.

The markets will crash one day but these so-called experts have no idea of this event will occur

#### U.S. not key

Molavi 11 – Afshin Molavi, Senior Fellow and Co-Director of the World Economic Roundtable at the New America Foundation, “US Economic Power is Part of a Healthier Global Order”, The National, 7-4, http://www.thenational.ae/thenationalconversation/comment/us-economic-power-is-part-of-a-healthier-global-order#full

Thus, the world faces the prospect of America slipping quietly into a "lost decade" of sluggish growth - of America sneezing and wheezing and coughing, but not facing a crisis moment. What will this mean for the world? Japan's growth throughout the 1970s and 1980s bolstered many of their Asian trading partners. Japan's demand was a boon. But Japan's lost decade in the 1990s did not stop the Asian tigers from rising. In some cases, countries such as South Korea and Taiwan even benefited from the Japanese slowdown, stealing away market share in key industries. The same may happen with an American "lost decade". A World Bank report in late 2009 noted that Latin American countries - the most exposed to American contagion - did not feel severe effects from the American crisis. The same goes for other emerging markets. So, perhaps the world will shrug off a steady American economic decline over the next five years. This is partly because the global economic pie is not a fixed size. As "the rest" rise, it grows. Thus, America controlled a quarter of the world's GDP in 1970 - roughly the same as today. But the pie is much bigger. Global GDP has tripled since 1970 and Asia today accounts for a quarter of global GDP. The pie is not only larger, but it is more balanced. Will there even be a "lost decade" after all? American corporations are sitting on large piles of cash. The problems with the economy have as much (perhaps more) to do with business confidence as with fundamentals. That could change. To be sure, the world is better off when America grows and produces and innovates. But if the declinists prove correct, then the cliché of "when American sneezes" will truly be tested once and for all. Or perhaps the world will be too busy to notice: emerging markets will be growing their middle classes, oil-rich Middle East states will be bolstering ties to Asia, and Chinese investments will flow across Africa and Latin America. And that sneezing $14 trillion (Dh51.4 trillion) economy would still be the envy of most countries around the world. We can put the cliché to rest: an American sneeze might not breed a global cold after all.

### Econ – UQ – General – 1AR

#### Uncertainty is the squo – radically increased enforcement efforts

Feuer 11-19 [Will Feuer, is a writer on CNBC.com's health and science team 11-19-2021 https://nypost.com/2021/11/19/us-chamber-of-commerce-accuses-ftc-of-waging-war-against-business/]

The US Chamber of Commerce on Friday slammed the Biden administration’s Federal Trade Commission chair Lina Khan, accusing her and the FTC of “waging a war against American businesses.”

“The FTC is waging a war against American businesses, so the U.S. Chamber is fighting back to protect free enterprise, American competitiveness, and economic growth,” said Suzanne Clark, president and CEO of the Chamber of Commerce.

“The FTC’s radical departure from its core mission under Chairwoman Khan is deeply concerning to our members across the business ecosystem. American companies are facing historic challenges with inflation, strained supply chains and worker shortages, while the FTC is going rogue and engaging in regulatory overreach that is accelerating uncertainty and threatening our fragile economic recovery.”

The Chamber sent three letters to the FTC dated Friday in which they cited potential breaches of administrative procedure that it said could be challenged in court.

The Chamber said it also filed more than 30 Freedom of Information Act requests with the FTC for “information on how it has manipulated its rules and procedures while potentially ceding its independent agency status to political interference.”

The documents requested through FOIA requests would likely include internal communications within the agency.

“Today, the Chamber is putting the FTC on notice that we will use every tool at our disposal, including litigation, to stop its abuse of power, to stand up for due process, and to protect the free enterprise system and America’s vibrant economy,” Clark said.

“And we will work with policymakers on Capitol Hill to hold the commission accountable.”

Ever since President Joe Biden nominated Khan to the role of FTC chairwoman, her left-leaning antitrust views have stoked controversy among corporate America and made her a darling of progressive politicians.

Both Amazon and Facebook have asked the FTC to recuse Khan from any antitrust actions against the companies, saying that her previously established views against Big Tech make her biased.

The FTC dismissed Facebook’s request, but hasn’t acted on Amazon’s petition.

In the letters sent Friday, the Chamber criticized the FTC’s recent efforts to take on false advertising, and to stop businesses from touting fake reviews and misleading endorsements.

The Chamber also said the FTC may have violated administrative procedure when it passed a new policy designed to deter mergers that are legally questionable.

And finally, the Chamber challenged the potential for any new policies to come out of a group formed by President Biden’s July executive order, the White House Competition Council, in which the FTC and other agencies discuss how to improve economic competition.

The Chamber said the fact that the White House formed the group means politics is interfering in any rules that come out of it.

FTC Office of Public Affairs Director Lindsay Kryzak responded to the Chamber’s letters by vowing not to back down.

“The FTC just announced we are ramping up efforts to combat corporate crime and now the Chamber declares ‘war’ on the agency,” she said in a statement.

“We are not going to back down because corporate lobbyists are making threats. We will continue to do our job and stand up for consumers, honest businesses, workers, and entrepreneurs who deserve a fair marketplace.”