## 1AC – Wake

### Innovation Adv

#### Advantage One: Innovation

#### Parker immunity discourages disruptive healthcare innovation

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

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

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

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

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

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

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

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

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

#### Disruptive innovation in healthcare solves pandemics

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

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

Introduction

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

INTRODUCTION

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

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

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

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

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

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

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

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

I. WHY ANTICOMPETITIVE REGULATION SUCCEEDS

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

A. The Generic Story

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

B. Additional Considerations Affecting Product Market Innovation

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

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

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

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

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

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

C. An Illustration from Automobile Distribution

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

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

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

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

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

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

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

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

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

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

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

A. Lochner, anti-Lochner, and Parker

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

B. The Potential for an Increased Level of Judicial Scrutiny

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

B. Considering Governmental Justifications for Restraints on Competition

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

C. Institutional and Procedural Distinctions

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

### Plan

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

### Federalism Adv

#### Advantage Two: Federalism

#### Scenario 1 is Tech:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

#### Scenario 2 is Spillovers:

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

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

1. Compacts meet “Federalism 3.0”

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

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

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

2. Horizontal harms in practice

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

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

#### Loss of Congressional capacity causes extinction

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

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

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

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

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

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

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

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

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

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

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

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

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

Recommendations

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

1. Invest in the future.

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

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

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

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

#### Factionalism causes adversary probing that collapses security

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

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

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

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

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

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

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

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

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

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

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

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

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

#### That goes nuclear

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

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

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

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

Introduction

IN just three relatively obscure antitrust cases, 1

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

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

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

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

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

III. DOCTRINAL CRITICISM

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

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

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

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

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

IV. PROPOSED SOLUTIONS

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

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

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

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

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

B. Spillover Effects and Antitrust Federalism

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Potential FTC Moves

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

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

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

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

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

Gaining Attention

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

State Action

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

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

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

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

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

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

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

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

Supreme Court Delivers another Blow to State Action Antitrust Immunity

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

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

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

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

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

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

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

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

## Adv 1

#### Cara concludes an ABR crisis is coming and only innovation can solve

MSU = Blue

**Cara 17**

Ed Cara, science writer for The Atlantic, Newsweek, and Vocativ, Vocactiv, January 27, 2017, “The Attack Of The Superbugs”, <http://www.vocativ.com/394419/attack-of-the-superbugs/>

Antibiotic-resistant infections kill at least 700,000 people worldwide a year right now, according to an exhaustive report commissioned by the UK in 2014, and **without any substantial medical breakthroughs or policy changes that slow down resistance**, they may claim some 10 million deaths annually by 2050 — eclipsing cancer in general as a leading cause. These deaths largely won’t come from pan-resistant infections, just tougher ones. A preventable death there, a preventable death here.

Leaving that aside, antibiotics, along with proper sanitation and nutrition, gird our entire way of living. Most every invasive surgery, pregnancy, organ transplant and chemotherapy session we go through will become riskier. Other diseases like HIV, malaria or influenza will become deadlier, since bacteria often exploit the opening in our immune system they leave behind. And already precarious populations like those living with cystic fibrosis, prisoners, and the poor will lose years off their lives.

**For all the** warranted **gloom**, though, Farewell does think **there are reasons to be hopeful**. **“I don’t think we are doing enough,** but the scientific community along with many governmental and private foundations are **very actively involved in finding not only new antibiotics, but new solutions to this problem**,” she said. **There’s been a noticeable change in attitude and increased urgency surrounding** **a**nti**b**iotic **r**esistance, she said, one that she hadn’t seen even five years ago, let alone twenty.

Until recently, that attitude change could be seen from places as high up as the U.S. federal government. In 2014, former President Obama issued an executive order aimed at addressing antibiotic resistance, the first real acknowledgement of the problem from an administration, devoting funding and outlining a national action for combatting resistance. Through its federal agencies, the administration pushed to reduce antibiotic use on farms and encouraged doctors to stop using them in excess.

“There has been a lot of work done the last couple of years, much of it spurred by [Obama’s] National Action Plan,” said Dr. David Hyun, a senior officer for Pew Charitable Trusts’ Antibiotic Resistance Project. The CDC, in particular, has used its funding to open up regional labs that allow them to better detect and respond to antibiotic-resistant outbreaks like the Nevada case, he said. They ultimately hope to create an expansive surveillance system that can easily keep track of resistance rates on a national, state and regional level. A parallel system also exists for monitoring resistance in the food chain, shepherded by the CDC and the U.S. Department of Agriculture.

In fact, it was this sort of cooperation between national and local health agencies that enabled Nevada doctors to stop the worst from happening, said Dr. Lei Chen. The swift identification of a possible CRE strain by the hospital, coupled with the woman’s medical history, led to a precautionary quarantine, while also prompting Chen’s public health department and eventually **the CDC** into action. And it **may help prevent future cases from spilling into the public**. According to Chen, the CDC has allocated funding this year to all of Nevada’s state public health departments so they can better detect CRE and other dangerous resistant strains.

Under the Trump administration, there’s no telling how these small victories will hold up or whether they will advance. All references to antibiotics once found on the Whitehouse.gov site have been removed, including a link to the Obama administration’s national action plan, and the fact that they’re already tried to bar USDA scientists from discussing their work with the public while stripping funding from other public health agencies isn’t encouraging.

**Even with the best** public **policy**, **however, there’s no clear light at the end of the tunnel**. Antibiotic resistance has gradually been worsening, even within the last 15 to 20 years, when superbugs like methicillin-resistant Staphylococcus aureus (MRSA) first became widely known, said Hyun. The effort needed to develop new drugs has been in short supply, hamstrung by pharmaceutical companies’ inability to recoup the costs of bringing new antibiotics to market. That’s because, unlike the latest heart medication, any new antibiotics will have to be treated like the last drops of water during a drought, used as little as possible — the exact opposite way to make money off a new product. Yet, much like climate change, the financial toll of not doing anything will total in the trillions years down the road. And it already numbers in the billions now, according to the CDC.

Of course, we need bacteria to survive. And most need or pay no mind to us in return. **Even pan-resistant bacteria don’t really mean harm.** Some have been found in perfectly healthy people, a fact that’ll either comfort you or keep you awake at night, only causing problems when our immune system wavers. **There’s no army of sentient E. coli that will rise up and someday overthrow the human race.**

But barring the cavalry showing up, a new fear of ours will learn to settle in, almost unnoticed. It’ll creep in when we pick our heads up from a nasty fall that scrapes our skin open or breaks our bones; when we wave goodbye to our loved ones before they enter an operating room, or when we cradle our newborns into a world teeming with the living infinitesimal, wishing there was still a way to shield them from it as our parents once could for us. A fear of naked vulnerability.

**The antibiotic apocalypse will be gentle**, if it fully arrives, but it won’t be any less devastating to the human spirit.

## Adv 2

# 2AC

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### Private Sector – 2AC

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

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

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

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

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

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

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

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

Private Sector

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

### Private Sector – 2AC - Addition

#### Public-private distinction in Parker is unanswered – our whole argument is that MORE antitrust violations should be considered private and then prohibited

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]

The public-private distinction has caused much uncertainty in the field of Parker immunity from federal antitrust laws.1 Due to federalism concerns, the U.S. Supreme Court held in Parker v. Brown that states as sovereigns are exempt from federal antitrust law.2 The question of when other entities acting under the auspices of state power are similarly exempt, however, remains largely unanswered. At which point does an entity gain sufficient “publicness” to obtain Parker immunity?3

[Footnote 3] See IA PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION ¶ 226b (3d ed. 2006) (“[D]etermining whether an actor is sufficiently ‘public’ so as not to require supervision has often proven difficult.”).

In North Carolina Board of Dental Examiners v. FTC, the Supreme Court recently attempted to bring clarity to this question in the context of a state occupational licensing board, labeled a state agency under state law.4 The Court held that the board, a decisive coalition of whose members were active members of the industry they were charged with regulating, was a private entity for purposes of Parker immunity.5

In 1950, about 5 percent of the American workforce occupied a job that required a state license.6 Today, that figure has skyrocketed to about one-third of the American workforce.7 Current market participants have incentives to lobby state legislatures to create these highly specialized licensing boards.8 The vast majority of state occupational boards consist of financially interested market participants.9 That anticompetitive policies have been on the rise can hardly be a surprise given the makeup of these boards.10

The role of Parker immunity for state occupational licensing boards therefore becomes a pivotal question. Are such entities exempt from federal antitrust law? To arrive at an answer, two threshold questions must be asked. First, does a particular state occupational licensing board fall under the “private” or “quasipublic” category in Parker immunity analysis? Second, if a board falls under the “private” category, what type of showing will suffice to satisfy the active state supervision requirement?

The Court’s decision in North Carolina Board of Dental Examiners has reinvigorated antitrust suits against state licensing boards. For example, Teladoc, a company within the telehealth industry that is committed to using telecommunication technologies to provide health care services, has brought claims against the Texas Medical Board, asserting that it had committed a violation of antitrust law for its formal rulemaking that required face-to-face visitation before a physician could issue a prescription to a patient.11 The parties stipulated that because the board was “largely composed of market participants,” the Texas Medical Board was a private entity, subject to the active state supervision requirement.12 In addition, state bar associations are now under attack from businesses like LegalZoom that offer legal document-preparation services and present a threat to licensed attorneys.13 In light of the North Carolina Board of Dental Examiners decision, the North Carolina Bar, controlled by active market participants, was forced to settle an antitrust suit brought by LegalZoom, permitting the online provider of legal services to continue operating in the state.14

States have scrambled to make recommendations and issue administrative rules and executive orders to adjust to this new antitrust reality. Oklahoma’s Governor issued an executive order concluding that sufficient statutory safeguards were in place for boards’ rulemaking powers but that procedural safeguards were insufficient to show active supervision for licensure or prohibition actions.15 Accordingly, the Governor ordered all non-rulemaking actions proposed by any state board controlled by active market participants to submit licensure or prohibition actions to the Office of the Attorney General for review.16 The Alabama State Board of Medical Examiners has issued an emergency rule suspending enforcement of telehealth rules immediately and seeking passage of a telehealth statute in light of the litigation brought against the Texas Medical Board.17 The Office of the Attorney General in California has issued an opinion examining the active state supervision requirement and identifying measures the legislature should take to reduce the risk of antitrust claims.18

Amid these developments, however, confusion in Parker immunity doctrine persists. The uncertainty stems from the Court’s failure to formally adopt the two principles that have shaped Parker immunity jurisprudence since its inception: financial disinterest and political accountability. In pursuit of much-needed doctrinal clarity, this Comment makes a descriptive case, inspired by Professor Einer Elhauge’s seminal article on Parker immunity,19 that Parker immunity jurisprudence has been shaped by inquiring into the functional purposes the public-private distinction serves in the context of delegating state power to municipalities, prototypical state agencies, and private entities. Two principles have shaped Parker immunity jurisprudence: (1) delegation of state power compromises political accountability, and (2) delegation of regulatory authority sacrifices the essential attribute of states as disinterested government agencies looking to the public good, rather than private gain.20

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### Neolib – 2AC – SAI – Short

#### Link is reductionist and can’t explain US-EU divergences

Foster 19 [Chase Michael Foster was a Doctoral Candidate at Harvard University at the time of this dissertation. The author has served as a Election Observer (OSCE, ODIHR) in Moldova, Belarus, Russia, Georgia and as a Teaching Assistant at the Harvard Kennedy School of Government. At the time of this writing, the author held a MPP (Democracy, Politics, and Institutions) from the Harvard Kennedy School of Government. “The Politics of Delegation: Constitutional Structure, Bureaucratic Discretion, and the Development of Competition Policy in the United States and the European Union, 1890-2017” – Doctoral dissertation to The Department of Government, Harvard University, Graduate School of Arts & Sciences. In partial fulfillment of the requirements for the degree of Doctor of Philosophy in the subject of Government - January 2019 - #E&F –https://dash.harvard.edu/bitstream/handle/1/41121359/FOSTER-DISSERTATION-2019.pdf?sequence=1]

Ideational Theories

Any analysis of the change in antitrust enforcement over time must begin with a consideration of ideas. Most of the existing social scientific scholarship on competition policy emphasizes the role of changing economic paradigms in spurring the transformation of European and American competition policy. A number of scholars of American antitrust have explained the dramatic decrease in antitrust enforcement as stemming from the shift in authority from lawyers to economists at the antitrust agencies (Eisner 1991). Others have emphasized the institutionalization of Chicago School-inspired economic ideas within antitrust jurisprudence (Ergen and Kohl 2017; Davies 2010; Pitofsky 2008). Both of these sets of accounts capture an important component of the shift. As theories of economic efficiency changed in the US academy during the 1960's and 1970's, much of the postwar enforcement program was delegitimized. Beginning in the early 1970's, both the prevailing judicial opinion on antitrust and the enforcement program of the antitrust agencies dramatically shift, leading to a precipitous drop in enforcement output, especially in areas such as vertical restraints, monopolies, and exclusionary practices.

The increase in the intensity of European enforcement has also been explained as the result of ideational change. Some EU scholars have argued that the institutionalization of neoliberal economic ideas in European regulatory law has led to the intensification of regulatory enforcement (Thatcher 2013; Buch-Hansen and Wigger 2010; Wigger 2008). Concomitant to the Single European Act, the European competition directorate began to more intensely apply competition rules, and to shift its enforcement focus to state aid, publicly-owned companies, and the promotion of competition in previously protected network industries (Quack and Djelic 2005). During the late 1990's, competition law modernization led to a more neoliberal approach to the evaluation of market competition, while also expanding the breadth and intensity of enforcement (Wigger and Nolke 2007).

While each of these accounts points to some of the real ways that ideational change affected competition policy in each system, there are problems with explaining opposite trends as the result of the same paradigm shift. An ideas-only approach leaves us in the awkward position of explaining both the increase in the intensity of competition enforcement in the EU and the decrease in antitrust enforcement in the US as resulting from the same (or similar) neoliberal policy paradigm. While any analysis of competition policy developments must account for ideational change, we need to understand why the same set of ideas has produced different patterns of enforcement in Europe and the United States.

Additionally, there are empirical gaps in the ideational explanation. Certainly, the influence of the Chicago School cannot account for why US regulators have failed to follow much of the neoliberal prescription for liberalization and industrial policy. Chicago School economists, after all, have long supported the application of antitrust in these areas (Van I lorn 2015; McChesney 1986; Bork 1978). Moreover, there is no shortage of classically-trained economists in the European competition system.

#### Cap’s sustainable and ensures global prosperity and environmental protection

Rhonheimer 20—teaching professor at the Pontifical University of the Holy Cross (Martin, “Capitalism is Good for the Poor – and for the Environment,” <https://austrian-institute.org/en/subjects-en/catholic-social-doctrine-2/capitalism-is-good-for-the-poor-and-for-the-environment/>, dml)

It is not social policy but capitalism that has created today’s prosperity.

What is important is that what made today’s mass prosperity possible – a phenomenon unprecedented in history – was not social policy or social legislation, organised trade union pressure, or corrective interventions in the capitalist economy, but rather market capitalism itself, due to its enormous potential for innovation and the ever-increasing productivity of human labour that resulted from it.

Increasing prosperity and quality of life are always the result of increasing labour productivity. Only increased productivity enabled higher social standards, better working conditions, the overcoming of child labour, a higher level of education, and the emergence of human capital. This process of increasing triumph over poverty and the constantly rising living standards of the general masses is taking place on a global scale – but only where the market economy and capitalist entrepreneurship are able to spread.

From industrial overexploitation of nature to ecological awareness

The first phase of industrialisation and capitalism was characterised by an enormous consumption of resources and frequent overexploitation of nature, which soon gave the impression that this process could not be sustainable. Since the end of the 19th century, disaster and doom scenarios have repeatedly been put forward, but in retrospect they have proved to be wrong: The combination of technological innovation, market competition, and entrepreneurial profit-seeking (with the compulsion to constantly minimise costs) have meant that these scenarios never occurred. The ever-increasing population has been increasingly better supplied thanks to innovative technologies, ever-increasing output with lower consumption of resources less harmful to the environment – e.g. less arable land in agriculture, or oil and electricity instead of coal for rapidly increasing mobility. More recent disaster scenarios, such as those spread by reputable scientists since the late 1960s and in the 1970s, have also proved to be inaccurate.

The reason things developed differently was the always underestimated innovative dynamism of the capitalist market economy, a growing ecological awareness and, as a result, legislative intervention that took advantage of the logic of market capitalism: As a result of the ecological movement that had come out of the United States since 1970, wise legislation began to use the price mechanism to apply market incentives to internalize negative externalities. Environmental pollution was given a price-tag.

This led to an enormous decrease in air pollution and other ecological consequences of growth, which is only possible in free, market-based societies, because the production process here is characterized by competition and constant pressure to reduce costs, i.e. to the most profitable use of resources. On the other hand, all forms of socialism, i.e. a state-controlled economy, have proved to be ecological disasters and have left behind destruction of gigantic proportions, without providing the population with anything that is near comparable in prosperity, often even by destroying existing prosperity, such as happened in Venezuela.

Capitalist profit motive combined with digitalization as a solution: Increasing decoupling of growth and resource consumption

Moreover, technological innovations combined with capitalist profit-seeking and market competition have led to a new and surprising phenomenon over the past decades, which is still hardly noticed in the public debate: the decoupling of growth and resource consumption (“dematerialization”). In a wide variety of industrial sectors, the developed countries, above all the U.S., are now achieving ever greater productive output with increasingly fewer resources. This has a lot to do with technology, especially the digitalization of the economy and of our entire lives.

As the well-known MIT professor Andrew McAfee shows in his book More from Less, published in October 2019, this process also follows the logic of capitalist profit maximization. To get it going, we do not need politics, even though wise, properly incentivizing legislation can be helpful and sometimes necessary. Above all, however, it is the combination of technological innovation, capitalist profit-seeking, and market-based entrepreneurial competition that will also solve the problem of man-made global warming.

In addition, property rights and their protection are decisive for the careful use of natural resources. And where this is not possible, legal support for collective self-governing structures, in accordance with the principle of subsidiarity, are important—as is analysed by Nobel Economic Prize winner Elinor Ostrom. By contrast, the growing ideologically motivated anti-capitalist eco-activism, and the policies influenced by it, are leading in the wrong direction, distracting precisely from what would be best for the climate and the environment—and distracting us from what could help protect us against the inevitable consequences of global warming.

#### Alt fails---transition is impossible and causes conflict. Even if transition occurs, it doesn’t solve

Smith 19 [Noah; 4/5/19; Bloomberg Opinion columnist, former assistant professor of finance at Stony Brook University; "Dumping Capitalism Won’t Save the Planet," https://www.bloomberg.com/opinion/articles/2019-04-05/capitalism-is-more-likely-to-limit-climate-change-than-socialism]

It has become fashionable on social media and in certain publications to argue that capitalism is killing the planet. Even renowned investor Jeremy Grantham, hardly a radical, made that assertion last year. The basic idea is that the profit motive drives the private sector to spew carbon into the air with reckless abandon. Though many economists and some climate activists believe that the problem is best addressed by modifying market incentives with a carbon tax, many activists believe that the problem can’t be addressed without rebuilding the economy along centrally planned lines.

The climate threat is certainly dire, and carbon taxes are unlikely to be enough to solve the problem. But eco-socialism is probably not going to be an effective method of addressing that threat. Dismantling an entire economic system is never easy, and probably would touch off armed conflict and major asdasd upheaval. In the scramble to win those battles, even the socialists would almost certainly abandon their limitation on fossil-fuel use — either to support military efforts, or to keep the population from turning against them. The precedent here is the Soviet Union, whose multidecade effort to reshape its economy by force amid confrontation with the West led to profound environmental degradation. The world's climate does not have several decades to spare.

Even without international conflict, there’s little guarantee that moving away from capitalism would mitigate our impact on the environment. Since socialist leader Evo Morales took power in Bolivia, living standards have improved substantially for the average Bolivian, which is great. But this has come at the cost of higher emissions. Meanwhile, the capitalist U.S managed to decrease its per capita emissions a bit during this same period (though since the U.S. is a rich country, its absolute level of emissions is much higher).

In other words, in terms of economic growth and carbon emissions, Bolivia looks similar to more capitalist developing countries. That suggests that faced with a choice of enriching their people or helping to save the climate, even socialist leaders will often choose the former. And that same political calculus will probably hold in China and the U.S., the world’s top carbon emitters — leaders who demand draconian cuts in living standards in pursuit of environmental goals will have trouble staying in power.

The best hope for the climate therefore lies in reducing the tradeoff between material prosperity and carbon emissions. That requires technology — solar, wind and nuclear power, energy storage, electric cars and other vehicles, carbon-free cement production and so on. The best climate policy plans all involve technological improvement as a key feature.

### Nielson Alt

#### Nielson supports progressive institutional change. Alt also fails – lacks global reach and critique-alone falls short.

Nielson ‘19

David, teaches and researches in the fields of class theory and political economy at the University of Waikato New Zealand – “Bringing in the ‘neoliberal model of development’” - First Published June 12, 2019 - #E&F - https://journals.sagepub.com/doi/10.1177/0309816819852746

At the same time, this article’s revised conceptualisation of model of development brings into the foreground the creative knowledge or praxis aspect that is central to making a better world. The socially progressive ideal model of development imagines a framework of collaborative positive-sum nationalism between cooperation states in a virtuous relation with universally stable and socially progressive modes of local production. The autocentric and pro-labour counter-regulatory emphasis of the Keynesian-led Fordist model of development resonates with the ideal model, but for a post-neoliberal model to be progressive, more than indirect constraint of capital’s power over the production process is required. In the present, capital’s production prerogative, expressed as a mutually reinforcing global competition-driven dynamic of profit and power, is systematically decimating locally sustainable self-sufficiency in agriculture and manufacturing, and is the power to which are being sacrificed social solidarity and people’s material needs. A post-neoliberal counter-hegemonic model of development needs to directly contest global production networks and zero-sum competition between countries by offering a stable and progressive localised alternative energised by international cooperation. Such a project requires the ideological inspiration of an alternative globalisation ethos of international mutual support and solidarity. This ethos needs to be politically reinforced by democratised institutions of global governance that are focused on the design of a model of development in which sustainable efficient local accumulation for each country can virtuously interact with its achievement for all countries.

Many discourses and practical projects push towards sustainable local accumulation.4 However, they confront both the hostile priorities and legitimating neoliberal discourses of the currently prevailing neoliberal model of development. The key challenges are to reverse the neoliberal regulatory framework and formulate a blueprint, with location sensitive variations, of a dynamically efficient, locally sustainable, and inclusively cooperative national model of production.5 Politically, the premise of this project is the reform and democratisation of the institutions of global governance. The key trans-national regulatory agency within this cosmopolitan democracy, inspired by Keynes’ concept of a world development bank, would be dedicated to collecting and diffusing the best practice knowledge, economic resources, and expertise needed to practically deliver viable socially progressive local accumulation regimes. Immediate priority would be given to bringing into actual practice locally sustainable accumulation for the countries that are presently least economically viable.

#### They don’t flip try-or-die – because imaging “new option” is insufficient. Their own author says the Aff need to bridge the theory-divide gap. Nothing in the alt does that.

### More

#### Backlash co-opts the alt – 2016 proves

Slobodian 21 (Quinn, Associate professor at Wellesley College, previously was a Residential Fellow at the Weatherhead Center for International Affairs, Harvard University, “The Backlash Against Neoliberal Globalization from Above: Elite Origins of the Crisis of the New Constitutionalism,” April 7th, 2021, https://doi.org/10.1177/0263276421999440)//NRG

The events of 2016 dealt a body blow to New Constitutionalism as both theory and practice. The British vote to leave the European Union ran counter to the trajectory of ever greater integration suggested by the New Constitutionalism. In the United States, the turn of both presidential nominees against the latest large-scale free trade agreement – the Trans-Pacific Partnership (TPP) – marked a swerve from the status quo of what has been called ‘the long 1990s’ (Purdy, 2018). While some advocates of Brexit called for free trade under ‘WTO rules’, Donald Trump campaigned directly against the WTO and NAFTA and commenced a sequence of escalating tariffs against Chinese imports within six months of his presidency, triggering the most significant breach of liberal trade policy for the US since the 1930s. The claim in the 2014 volume on New Constitutionalism that ‘in contemporary global politics there can be few more popular normative appeals than to the rule of law’ felt immediately outdated (May, 2014: 63).

The first response from scholars of neoliberal constitutionalism was to claim that the apparent deviation only proved their theory correct. Globalization’s chickens had come home to roost and we were witnessing the ‘return of the repressed’ (Streeck, 2017) as disgruntled populations began ‘opting out of global constitutionalism’ (Hirschl, 2018). By delegating ever more tasks of governance to the supranational level, nation-states had undermined their own legitimacy, eroding mass consent for economic and legal globalization (Grewal, 2018). Granted, the backlash came from an unexpected quarter – not the grassroots social movements of the left (Adler, 2014; Della Porta et al., 2006; Tarrow, 2005; Teune, 2010), but from the right. Still, some scholars were relatively untroubled, taking the short leap to a grudging support for the insurgent political forces opposing supranational integration. Wolfgang Streeck described the ‘populist’ Eurosceptic parties as a ‘communitarian response to the neoliberal competition regime’ whose ‘demands for a decentralized, distributed architecture of political rule’ represented ‘the better arguments’ (Streeck, 2019: 14). Another scholar wrote that ‘[o]ne of the reasons for the populist appeal of Trump is undoubtedly the way he has challenged neoliberal reason’ (Kiely, 2017: 741). Others contended with more circumspection that popular resentment was being commandeered to serve political ends unlikely to remedy the original grievances (Rodrik, 2018). Some were even more skeptical about the backlash’s grassroots origins, diagnosing an emergent ‘neo-illiberalism’ combining features of ethno-nationalism with elite imperatives of cross-border capital mobility (Hendrikse, 2018).

#### Their theory of power is binaristic – that fails and generates backlash-from-above that only the perm can resolve through mixed strategies

Slobodian 21 (Quinn, Associate professor at Wellesley College, previously was a Residential Fellow at the Weatherhead Center for International Affairs, Harvard University, “The Backlash Against Neoliberal Globalization from Above: Elite Origins of the Crisis of the New Constitutionalism,” April 7th, 2021, https://doi.org/10.1177/0263276421999440)//NRG

One can see why critical scholars of global political economy favored the narrative of a ‘backlash from below’ (Frieden, 2018). The storyline of ‘an epic struggle between globalization and a resurgent nationalism’ (Crouch, 2019: 1) is attractive in its elegance and has the advantage of confirming the priors of scholars who found the legitimacy of the status quo unsustainable. It finds the seeds of discontent where they expected to find them: among those suffering economic loss, wage stagnation, and demographic change. It offers clear binaries: open versus closed, free trade versus protectionism, Smith versus Fichte, globalists versus populists, ‘citizens of nowhere’ versus ‘citizens of somewhere’ – perhaps, as the title of this special issue proposes, even neoliberalism versus post-neoliberalism.

The reliance on such binaries in interpretations of the backlash is striking. This article contends that it is also a partial story that obscures important origins of the current predicament. The backlash-from-below narrative relies on a stark scalar divide between an upper stratum of interlocked states, supranational institutions, and capitalist elites, and a lower stratum of fragmented national populations subject to their decisions. Theories of neoliberal constitutionalism support this binary by asserting, both implicitly and explicitly, a coherence of interests at the elite level around projects of free trade and neoliberal globalization. Even if qualifications about the ‘internal contradictions’ among capitalist elites were routine in the literature, the fundamental unity of the ‘Transnational Capitalist Class’ (Robinson, 2014) was maintained in practice. Because the super-stratum was comprised of globalization’s winners, by definition, the sub-stratum must contain its losers. By lumping too many interests together, the interpretative straitjacket of New Constitutionalism made it difficult for critical scholars to differentiate between the backlash from the left and the right. Thus, Bernie Sanders and Trump become common symptoms of a backlash or a ‘global organic crisis’ (Gill, 2018).

My argument – which is also a self-critique – is that scholars of New Constitutionalism may have read their opponents too closely and reproduced their arguments too faithfully. By adopting the framing of neoliberals themselves, the relatively static diagnosis of New Constitutionalism partakes in its own kind of ‘End of History’ delusion, reifying what was ultimately one of many competing propositions about organizing global political economy.

Ran Hirschl reminds us that trends toward constitutionalization in the 1990s arose from ‘a sense of threat, not hubris’ (Hirschl, 2014: 106). To defenders of the multilateral free trade order, the enemy was from outside the business community, including NGOs and civil society groups in the Global North, and untrustworthy electorates in the Global South. But the threat was also from within the business community: the pleading of corporate lobbyists and special interests for preferential treatment. Law has distributive effects and forms part of distributive struggles (Kennedy, 2016). Any global economic legal settlement ‘represents a political deal brokered in the context of power and special interests’ (Pauwelyn, 2005: 331), not the interests of a putatively unitary ‘capital’ in the abstract. To understand the dimensions of the current rupture, we must be attentive not only to the ‘left behinds’ (Ford and Goodwin, 2014) of globalization in the electorate but those sectors of capital who have felt left behind in the movement to freer trade.

This article proposes that the elite losers of the 1990s settlement are neglected forces in the disruption of the status quo of US trade policy. The US steel industry, in particular, has been disproportionately influential as an opponent of free trade. Though steel manufacturing plays a minor role in the US economy, accounting for less than 1 percent of employment and exports, it is symbolically important to issues of deindustrialization, unemployment, and masculinity, especially in the Midwestern states key to Trump’s victory (Sandbu, 2017). Steel lobbyists, including Nucor’s Dan DiMicco, framed a critique of actually existing neoliberal globalism that Trump adopted and acted on as part of his trade war. As we will see, the steel industry is a red thread linking Trump’s primary advisers on matters of trade, US Trade Representative Robert Lighthizer, Commerce Secretary Wilbur Ross, and Director of Trade and Manufacturing Peter Navarro. By looking at one particular sector of the disgruntled corporate elite, we see that the contemporary challenge to neoliberal globalization and the New Constitutionalism is not simply a backlash from below; it is also a backlash from above.

Robert Lighthizer and Competitive Liberalization

The so-called neoliberal era has been marked by frequent deviations from the rules of multilateral free trade

implied by the New Constitutionalism. Perhaps most notably, the 1980s saw an extension of the New Protectionism of the 1970s (Green, 1981), when Ronald Reagan used a series of quotas, ‘orderly marketing arrangements’ and ‘voluntary export restraints’ to protect threatened domestic economic sectors. The 1980s saw a so-called Super 301 investigation added to the already existing Section 301 investigation included in the 1974 Trade Act. These legal instruments allowed for investigations by the US Trade Representative leading to the unilateral levying of tariffs or quotas on imports from countries deemed to be practicing ‘unfair trade’.

Far from gestures toward isolationism or autarky, these were market-opening maneuvers, driven by US frustration at their perceived disadvantage in the global legal landscape (Destler, 2005: 124). One such expression of frustration came from the real estate magnate Donald J. Trump, who declared in 1986 that ‘I believe it’s very important that you have free trade. But we don’t have free trade right now’ because of barriers to economic investment in booming countries like Japan and Saudi Arabia (Trump and King, 1987). The idea that one might have to break the rules of multilateral free trade through unilateral action to get to the end point of free trade in practice – also known as ‘competitive liberalization’ (Bergsten, 1996) – was a common sentiment of the decade. Some have gone as far as to call this ‘neoliberal protectionism’ (Wraight, 2019) in its use of state power to achieve the end goal of more open global markets.

One actor involved in 1980s trade negotiations would later become Trump’s most powerful trade official, Robert Lighthizer. A native of Ohio born in 1947 who attended Georgetown at the same time as former President Bill Clinton, Lighthizer served as the chief counsel for the Finance Committee under Senator Bob Dole beginning in 1978 before being appointed Reagan’s Deputy USTR in 1983. He was the chair of the US-Japan Investment Committee and helped negotiate limits on the import of Japanese steel. The US negotiated export restraints with Japan in 1984, two years after it had negotiated similar ones with the European Community (Destler, 2005: 195). Cresting on an established record of deploying state power to protect private interests, Lighthizer returned to the private sector in 1985, working for the storied Wall Street law firm Skadden Arps and acting as a lobbyist for the steel industry and ‘lead counsel for U.S. Steel in trade litigation’ (Johnson, 2018: 710). When Lighthizer became Trump’s USTR in 2017, he brought multiple members of the firm along, including the new ambassador to the WTO (Politi, 2018).

Free trade economists were ambivalent about the so-called export protectionism of the 1980s. Jagdish Bhagwati read Reagan’s rampant use of executive action on trade as a symptom of what he called ‘diminished giant syndrome’, where the US lashed out in fear of its loss of industrial dominance and compelled its trading partners to take measures that increased US competitiveness. While he disapproved of the method, Bhagwati acknowledged that these actions often functioned in the interest of opening markets. He and economist Douglas Irwin described the approach as ‘the return of the reciprotarians’, comparing it to the ‘fair traders’ of the late 19th century in Britain who also used trade deals to open new markets (Bhagwati and Irwin, 1987). Many others saw the unilateral actions of the US as productive. The measures did not conform to the spirit of the New Constitutionalism but they did help drive nations to the negotiating table for the WTO, which many weaker nations perceived as a second-worst option to dealing with the erratic executive action of the United States.

On its face, the WTO, inaugurated in 1995, was an entirely different animal than the Reaganite repertoire of export protectionism. Its champions claimed it ushered in a world economy governed by ‘rules’ as opposed to the ‘power’ of its forerunner organization, the GATT (Jackson, 1978: 98). From one perspective, the WTO’s architects were extraordinarily successful. Speaking at the neoliberal think tank, the Institute of Economic Affairs, in 2015, the WTO’s first director, Peter Sutherland, paid homage to a neoliberal icon when he said that the WTO’s framers ‘drew on two of Hayek’s key insights – the role of the price system in conveying information and the importance of the rule of law’ (Slobodian, 2018b: 273). The two features of Rule of Law for Hayek – isonomy or ‘same law’ and enforcement – were indeed covered in the WTO by the gradual elimination of special treatment for developing nations and the creation of a Dispute Settlement Mechanism with binding judgements. One of the active participants in framing the WTO enthused that it could serve as a model to help make ‘market freedoms’ into universal human rights (Petersmann, 1996–7).

Scholars who deploy the framework of the New Constitutionalism often adopt Sutherland’s framing as read. They take for granted that the state was bound in a two-level game, and decision-making was removed to an international space. Not all observers agreed. As many noted, it was easy to overstate the constitutional status of the WTO. The ‘constitutional conceits’ (Dunoff, 2006) propagated by some of those involved exaggerated the power of the WTO, which remained, as with all forms of international law, only as powerful as the states permitted it to be (Howse and Nicolaïdis, 2001). While novel in some respects, the WTO was, from another perspective, just another forum for pursuing special interests.

How did different sectors of US capital fare under the WTO settlement? Some were served well by the WTO’s ‘North-South Grand Bargain’ (Ostry, 2002). Pharmaceuticals, apparel, software and entertainment, in particular, saw their demands for intellectual property law covered despite the fact that, as some economists protested, their demands were not even trade-related (Bhagwati, 1994). Finance was clearly aided by the liberalization of services and capital movements. By contrast, textiles lost the special protection they had enjoyed under the export quotas of the Multi-Fiber Arrangement, and heavy industry was opened up to new overseas competition, especially after the accession of China to the WTO in 2001.

Within a decade of the WTO’s passage it was clear that the most disruptive domestic opponents of the new multilateral settlement would not be the labor and environmental groups that free traders feared most (Barfield, 2001). Rather, it would be the elite losers: those industries undercut by imports enabled by the expansion of free trade and liberalization of investment flows. While some sectors of capital had secured their interests by way of the WTO deal, others would seek the same protection from the state by other means.

Wilbur Ross and the Protectionist Put

Steel offers an illustration of the recurrence of state protectionism again. The Asian Financial Crisis of 1997–8 flooded the US market with cheap steel imports, contributing to the loss of nearly 200,000 jobs in the sector as factories closed or went bankrupt (Irwin, 2017: 661). The steel industry’s requests for 1980s-style protection fell on deaf ears at first but scored a victory in 2002 when the Bush administration placed a tariff of up to 30 percent on some steel imports (Irwin, 2017: 673). The response from WTO member states was swift and the Geneva trade body ruled against the US, leading Bush to drop the tariffs within 18 months. The interlude of the Bush steel tariffs is usually read as a mere footnote in trade history (Destler, 2005: 245). One might even read it as an affirmation of the strength of the new free trade consensus were it not for the way that it previewed the dynamics that would return with Trump’s trade war.

The tariffs were consequential for their effect on the fate of someone who would become Trump’s second most influential trade official: future Commerce Secretary Wilbur Ross. Ross spent the first decades of his career at Rothschild advising in bankruptcy proceedings, including Trump’s own in 1990, when he advised the creditors of the Trump Taj Mahal. Ross was known as the ‘King of Bankruptcy’, helping restructure $200 billion in liabilities in an era when filing for Chapter 11 bankruptcy went from being a source of personal shame and a sign of failure to a profitable corporate strategy (Delaney, 1992; Skeel, 2003). In 2000, Ross set up his own so-called vulture fund specializing in acquiring, restructuring and reselling distressed assets. His biggest victory happened as a direct result of the Bush steel tariffs.

Beginning in 2001, Ross bought a series of ailing or bankrupt steel companies, restructured and merged them as the International Steel Group. With US steel prices momentarily buoyed by the tariffs, Ross sold the company to Lakshmi Mittal in May 2005 at a profit of $260 million (Fong, 2005). Ross held a seat on the board of directors of what would become the world’s largest steel company, ArcelorMittal, until taking the post of Commerce Secretary in 2017. The business press dubbed Ross a ‘man of steel’ (Olijnyk, 2004) for his successful tactic of ‘betting on protection’ in the Mittal deal (Tejada, 2003). The passing use of protection was apparently not in conflict with Ross’s own statement that he and Mittal were both ‘strong believers, first, in globalization’ (Anonymous, 2004).

On display here was a skill that Ross deployed during his whole career: taking advantage of the nexus of law, policy, and market to maximize personal profit. Journalists observed that Bush’s actions on steel taught Ross ‘the value of government intervention’ (Malone, 2003). In responding to recriminations on the campaign trail about his record of bankruptcies, Trump’s stock response was a similar one. He shrugged that he had ‘used the laws of the land’ (Anonymous, 2016). Ross’s approach reflected the understanding he would bring to the White House. Policy was not aimed at goals of universal welfare or efficiency but was an appendage of particular private interests. Capitalism worked best by leveraging the state in service of private profit.

Ross’s attitude toward trade policy was led by a bloodless pragmatism. In September 2003, he launched a new lobbying group of which he was founder and chairman: the Free Trade for America Coalition. The group brought together a ‘coalition of steel, textile, glass, copper and brass, cattle, honey and sugar companies with the Paper, Steel and Textile Unions’, in Ross’s words, ‘to educate the American people and their elected representatives of the consequences associated with international trade deficit and to campaign against unfair international trade practices’ (Anonymous, 2003). Ross boasted of being the first representative from management to attend an anti-free trade rally of the United Steelworkers and he vocally opposed further trade liberalization in the Americas at their meetings (McCarthy, 2003). His hope was that the protection given to steel would be extended to another sector as he sought to repeat his success with the International Steel Group with an International Textile Group, snapping up bankrupt companies in that sector.

When a second coming of what we could call the ‘protectionist put’ was not forthcoming, Ross deftly flipped his message, supporting precisely the kind of treaty he’d opposed in the Central American Free Trade Agreement (CAFTA), earning the justified label of ‘turncoat’ from his former allies in organized labor (Patterson, 2004). He explained his logic when he discussed the addition of a denim plant in Guatemala City to his already existing overseas textile manufacturing operations: ‘Guatemala is a very logical place from a CAFTA point of view … The normal wage in this industry is a little under $200 a month. That is getting down toward the China level’ (Malone, 2004). The following year, he went to the bottom of the wage scale, breaking ground for a textile factory outside of Shanghai, performing the act he had vociferously condemned to US textile workers just two years earlier (Fong, 2005).

Ross’s self-defense was telling. Asked by a reporter at a press conference whether he was advocating protectionism to preserve his own investments, he responded ‘it absolutely is. I don’t see any reason [why] that should be criticized. Do you believe the foreign governments are protecting anyone’s interest but their own? I doubt it’ (Nash, 2003). When pushed on his reversal in support for CAFTA, he repeated the theme: ‘I believe that everyone in the industry should be acting in his or her own self-interest’ (Patterson, 2004). Ross’s status as distressed investor meant an endless motility of rhetoric: a belief that an asset must always be talked down until the right point to buy and up until the most advantageous moment to sell. We see here a surface loyalty to the logic of shareholder value (Davis, 2009) and a deeper commitment to what Martijn Konings calls ‘the logic of leverage’ (Konings, 2018b). Far from the tropes of neoliberal constitutionalization ensuring uniform predictability of economic exchange, Ross practiced the nimbleness of speculation under conditions of uncertainty (Feher, 2018).

Peter Navarro and Heartland Sinophobia

Wilbur Ross’s interest in steel faded with his personal stake in the industry. More engaged was the third figure destined to play an influential role on Trump’s trade team as his Director of Trade and Manufacturing: University of California-Irvine economics professor Peter Navarro. In 2011, Navarro co-wrote a book with business school professor Gene Autry called Death by China: Confronting the Dragon – A Global Call to Action (Navarro and Autry, 2011). The book was a sensationalist reflection on China’s economic rise, including a barrage of anecdotes about China’s adulterated food products, alleged collaboration with dictators, and unregulated pollution. Beginning with an epigraph from Albert Camus that ‘it is the job of thinking people not to be on the side of the executioners’, the authors accused China of becoming ‘the planet’s most efficient assassin’ under whose regime of unfair competition the ‘American blue-collar worker has become an endangered species’ (Navarro and Autry, 2011). The book targeted US business organizations as ‘soldiers in the pro-China lobby’ and accused politicians of a similar complicity.

Navarro adapted Death by China into a documentary film of the same name narrated by Martin Sheen (and streamed well over a million times online as of late 2020). The film is replete with startling animations. Blood spurts out of the US Midwest as a hunting knife marked ‘made in China’ plunges into it. Chinese bombs reading ‘income tax breaks’ and ‘illegal export subsidies’ pulverize American factories. Bayonets reading ‘slave labor’ and ‘child labor’ parade in front of Mao Zedong’s portrait. A shell game shows China taking ‘jobs’, multinational corporations taking ‘profits’, and the US government holding ‘debt’. The flags of Microsoft, GE, Caterpillar, and Boeing are hoisted over both the US Capitol building and Beijing’s Forbidden City. The effect is heartland Sinophobia: a hybrid spirit of the patriotic globalization critique of the films of Michael Moore and long-standing tropes of Chinese treachery and civilizational depravity.

Journalists later revealed that funding for the film came from the country’s second-largest steel company, Nucor, funneled through a non-profit organization (Timiraos and Ballhaus, 2018). Both film and book followed closely the talking points of Nucor’s CEO at the time, Dan DiMicco. Singled out as an exemplary CEO in Death by China, DiMicco is also quoted as saying: ‘We’ve been in a trade war with China for more than a decade. But they are the only ones firing the shots!’ (Navarro and Autry, 2011: 66, 242). DiMicco spoke on behalf of one of the perceived losers of free trade globalization as employment in steel had been hit by the so-called ‘China Shock’ of import competition alongside the much more consequential increase in productivity (Griswold, 2019). He pioneered many of the points later taken up by Trump, including the attack on China’s ‘mercantilist and predatory trading practices’, including currency manipulation and illegal subsidies, and the call for domestic energy independence and protection of domestic manufacturing (DiMicco, 2009). In an op-ed co-authored with Navarro, DiMicco described China as a global threat that needed to reform or ‘be engulfed in a trade war largely of its own making’ (Navarro and DiMicco, 2010).

The echoes of DiMicco in Trump’s rhetoric are not coincidental. DiMicco was one of Trump’s campaign advisors, alongside Navarro and a range of hedge fund managers and real estate CEOs, along with veterans of the neoliberal think tank archipelago like Stephen Moore of ALEC and Club for Growth and the inspiration to Reagan’s top marginal tax cuts, Arthur Laffer (Matthews, 2016; Moore and Laffer, 2018). DiMicco took the lead on trade policy for Trump, steering the transition team on the USTR and interviewed for the job himself before the selection of Lighthizer (Fares and Lawder, 2016). True to DiMicco and Navarro’s threats, among the first acts of the new government was the commencement of a trade war through steel and aluminum tariffs with China as a primary target. This was done first through a ‘national security clause’ (Section 232) followed by further tariffs authorized by a Section 301 investigation led by Lighthizer (Park and Stangarone, 2019; Slobodian, 2018a). A 25 percent tariff was placed on steel in 2018, lifted for Canada and Mexico in 2019. Trump tweeted regularly about steel, perhaps most memorably on 2 March 2018, when he wrote: ‘We must protect our country and our workers. Our steel industry is in bad shape. IF YOU DON’T HAVE STEEL YOU DON’T HAVE A COUNTRY.’

How to make sense of the steel industry’s apparent capture of US trade policy? In sponsored vehicles for their message like Death by China, steel lobbyists crafted a persuasive narrative about the immiseration of the heartland and those left behind by globalization, reproduced by many journalists and politicians despite the sparse evidence that tariffs have the capacity to reverse the symptoms identified. Protection did pay off in the short run for Nucor’s shareholders as the stock price doubled from January 2016 to January 2018, though it has fallen since. Was Trump’s steel-friendly trade policy the opposite of New Constitutionalism? A ‘post-neoliberal’ return to ‘power’ after the 1990s dogma of ‘rules’?

One must draw distinctions between the economic imaginaries of Trump’s advisors. Lighthizer continues to adhere to ‘competitive liberalization’, according to which unilateral action can be market-opening, producing a more ‘level playing field’ (to use the common metaphor) and perhaps even a future multilateral settlement (Wraight, 2019). Arriving at this destination requires many of the tools of the New Constitutionalism. Lighthizer is keen on extending the purview of economic juridicization well beyond the Chinese border into its court system to ensure compliance with intellectual property laws. In this sense, we see an intensification of some aspects of the legalized political economy of the 1990s and certainly the market-opening protectionism of the 1980s (Miller, 2018).

Navarro, by contrast, tends toward the more radical demand of ‘decoupling’ the US economy from China. Rather than a transitional phase of tariffs to arrive at a free trade telos, he foresees manufacturing supply chains disentangled permanently to protect against national security vulnerabilities (Irwin and Bown, 2019). Navarro’s concern extends to infrastructure, placing military concerns ahead of economic interests in a version of what scholars have called ‘weaponized interdependence’ (Farrell and Newman, 2019) and ‘geoeconomics’ (Roberts et al., 2019). The gap between Lighthizer and Navarro’s policy vision makes clear that the desire of state protection by certain sectors of capital may be constant but the larger strategy within which this desire is fulfilled is an object of ongoing contestation.

Conclusion

The central metaphor of the New Constitutionalism comes from Homer’s Odyssey. Passing the island of the beguiling Sirens, Ulysses requests to be bound to the mast to enjoy their songs without wrecking his ship (Teubner, 2012). The metaphor of constitutional ‘pre-commitment’ (Elster, 1977) is deployed by both neoliberal theorists and their critics to describe the constraints placed on governments, and by extension, the populations that elect them to ward off the seductive appeal of trade protection and the blandishments of special interests (Brennan and Buchanan, 2000: 82; Lal, 1984: 25; Tucker, 2018: 223). The narrative logic is unforgiving: to loosen the bonds would mean total destruction.

Much of the alarm (or elation) since 2016 has sprung from a common impression of Ulysses unbound. The ‘liberal international order’ was undone, we were often told, and the ships of economy and state roved free at the risk of scuttling themselves. Yet compare the metaphor to reality. Even if neoliberal ideologues like Hayek and Buchanan believed that the sovereign itself had to be bound, the US as hegemon was only ever provisionally persuaded to engage in limiting itself by trade rules. Even the preeminent theorist of precommitment, Jon Elster, conceded that ‘in politics, people never try to bind themselves, only to bind others’ (Elster, 2000: ix). The Ulysses metaphor misleads by compressing all state and capitalist interests into a single figure, thus eliding important divisions.

Nevertheless, returning to the metaphor may accommodate the alternative reading proposed in this article. Recall that the Sirens tempted Ulysses by promising him not just pleasure but foresight. Homer wrote that ‘he who listens [to their song] will go on his way not only charmed, but wiser’, for the songs ‘can tell you everything that is going to happen over the whole world’. It was precisely such reassurances about the future that special interests sought through the protections afforded by the legal repertoire of the state, whether it was Ross exploiting state intervention for a short-term sale, Lighthizer’s clients seeking countervailing duties from a US administration, or DiMicco seeking semi-permanent protection for his sector of manufacturing.

Scholars argue that the neoliberal mode of rule defaults to a repetitive two-step by governing through uncertainty in the surrender of control over the economic future to private actors within a market framework followed by inevitable episodic interventions to rescue the wealthy in the moments of systemic crisis that follow (Davies and McGoey, 2012; Gindin and Panitch, 2012; Konings, 2016). This formula of privatizing profit and socializing risk is especially applicable to the financial sector, where losses can be as profitable as gains, depending on the direction of one’s wager. Neoliberalism studies have, for good reason, been dominated by a focus on finance (Fine, 2009; Konings, 2018a). Yet trade and manufacturing operate differently, requiring more regularity and longer time horizons. From the point of view of the capitalist engaged in export manufacturing, one sees less the binary option of Ulysses bound or freed but, more pragmatically, an ongoing effort to forge alliances with the Sirens on a choppy sea as sources of knowledge about the future. The lobbying of Congress, the Commerce Department and the USTR for special attention is part of a hope to ‘lock in’ a different future than that usually envisioned by the New Constitutionalism literature: not a neutral grid for entry and exit but a partisan effort at preserving market share in a field of rising competitors.

Attempts so far to explain Trump from within the framework of neoliberalism studies have been somewhat tortured. Descriptions of Trump as ‘neoliberalism’s Frankenstein’ (Brown, 2018) have productively pointed to the unexpected consequences of neoliberal policies, but they can also serve to re-inscribe a chiliastic framework of neoliberalism in the process of unraveling. The eschatological mode has not served the study of neoliberalism well, as the trail of announcements of its demise attest. Every death of neoliberalism, as it is now routine to observe, portends a new ‘mutation’ (Callison and Manfredi, 2019; Ong, 2006; Sornarajah, 2011).

It may be that the effort to arrive at a single storyline has been one of our primary obstacles. The influence of the Regulation School has pushed for the identification of sequential eras, stages, or epochs. The story offered in this article suggests that we can best understand Trump’s trade policy as born within the range of legal instruments indigenous to the ‘neoliberal era’ of the last 40 years. Because free trade and protection coexisted, the before/after frame is changed into one of uneven coevality.

As we have seen, the tendency of the New Constitutionalism to homogenize the needs and aims of capital in the abstract overlooked the ongoing power of those sectoral capital interests disadvantaged by free trade globalization. By giving the impression of an overly coherent package, critics underestimated the power of particular sectors of capital in bending legal structures to their benefit. Attending to the distributive effects of new legal regimes within the capitalist class itself helps us to find prefigurations of later crises. We must take seriously the fact that it is in the commanding heights as well as in the suffering provinces that the roots of the current split in the US philosophy of global economic governance can be found.

## FTC CP

### Section 5 CP – 2AC

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

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

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

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

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

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

## Adv CP

### Licensing Board CP – 2AC

#### **Banning licensing is too far – leads to corporatized medicine which leads to worse outcomes**

Robinson 18 (Nick, Affiliated Fellow, Center on the Legal Profession, Harvard Law School, “The Multiple Justifications for Occupational Licensing,” Washington Law Review, vol. 93, no. 4, December 2018, p. 1903-1960. HeinOnline, <https://heinonline.org/HOL/P?h=hein.journals/washlr93&i=1937)//NRG>

C. Relationships of Trust

Eliot Freidson famously described professional self-regulation as the "third logic." 212 He claimed that professions were traditionally guided by neither the consumerist logic of the market nor the management driven logic of bureaucracy, but instead expertise coupled with an internal code of ethics.213 This understanding that practitioners aspire towards a higher occupational mission can encourage trust between practitioners and consumers, the public, government, and other professional colleagues. For example, the public has historically trusted doctors to give advice in a patient's best interest, not the doctor's financial interest (even if this trust has declined in the United States in recent decades). 214 Lawyers rely on other lawyers not to lie to them during discovery.2 " 5 And the government relies on architects to help enforce building codes216 or doctors to help decide who qualifies for government programs like social security disability." 7 Importantly, professional communities frequently work to pass on this sense of social trusteeship to new practitioners as they meet their educational licensing requirements, and later, if this trust is seriously betrayed, these practitioners may have their occupational license revoked.2

Since licensing provides a monopoly to practitioners to engage in an occupational activity, licensing can limit the ability of large corporations and other employers from exercising disproportionate control over either practitioners or their occupation. Michael Sandel has claimed that to further the ideals of republican self-governance, workers need to be empowered to have greater economic autonomy-freed from brute market forces that can distract citizens from their democratic duties and the concentration of power in large corporations that can undermine the public square.2 " 9 While Sandel does not invoke professions specifically in his argument, occupational licensing, and the professions' self-regulation, provides one avenue for producers to exercise power over their work and employment market.

Indeed, professional self-regulation, in particular, can reduce the potential for capture of regulation by large corporations. For example, in the United Kingdom, the Legal Services Board regulates the legal profession and is controlled by non-lawyers.21 Commentators have raised concerns that these public regulators may be unduly influenced not by the bar, but instead by corporate interests that desire to liberalize the legal market to allow corporations to directly profit from providing legal services.2

## Floodgates

### Floodgates DA – 2AC

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

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

B. Institutional Constraints and Capacities

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

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

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

Their card for reference. MSU = Blue.

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

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

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

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

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

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

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

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

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

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

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

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

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

Conclusion

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

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

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

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

## OS

### DOJ – 2AC

#### Current cases thump.

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

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

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

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

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

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

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

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

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

#### Other entities can enforce.

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

C. Improving Capability: Agency Cooperation and Project Selection

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

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

#### States fill-in

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

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

### Cyber Impact – 2AC

#### No chance of large-scale cyber attacks

James Andrew Lewis 20, Senior Vice President and Director of the Technology Policy Program at the Center for Strategic and International Studies, “Dismissing Cyber Catastrophe”, Center for Strategic and International Studies, 8/17/2020, https://www.csis.org/analysis/dismissing-cyber-catastrophe

A catastrophic cyberattack was first predicted in the mid-1990s. Since then, predictions of a catastrophe have appeared regularly and have entered the popular consciousness. As a trope, a cyber catastrophe captures our imagination, but as analysis, it remains entirely imaginary and is of dubious value as a basis for policymaking. There has never been a catastrophic cyberattack.

To qualify as a catastrophe, an event must produce damaging mass effect, including casualties and destruction. The fires that swept across California last summer were a catastrophe. Covid-19 has been a catastrophe, especially in countries with inadequate responses. With man-made actions, however, a catastrophe is harder to produce than it may seem, and for cyberattacks a catastrophe requires organizational and technical skills most actors still do not possess. It requires planning, reconnaissance to find vulnerabilities, and then acquiring or building attack tools—things that require resources and experience. To achieve mass effect, either a few central targets (like an electrical grid) need to be hit or multiple targets would have to be hit simultaneously (as is the case with urban water systems), something that is itself an operational challenge.

It is easier to imagine a catastrophe than to produce it. The 2003 East Coast blackout is the archetype for an attack on the U.S. electrical grid. No one died in this blackout, and services were restored in a few days. As electric production is digitized, vulnerability increases, but many electrical companies have made cybersecurity a priority. Similarly, at water treatment plants, the chemicals used to purify water are controlled in ways that make mass releases difficult. In any case, it would take a massive amount of chemicals to poison large rivers or lakes, more than most companies keep on hand, and any release would quickly be diluted.

#### Local enforcement is key and ineffective now.

Michael Garcia 21, Former Senior Policy Advisor, “Follow the Money: Few Federal Grants are Used to Fight Cybercrime,” Third Way, 2/16/21, https://www.thirdway.org/report/follow-the-money-few-federal-grants-are-used-to-fight-cybercrime

Like traditional crime, not all cybercrime rises to the level that requires a federal response. And like other crimes, victims will call upon state and local law enforcement to respond.1 They are unprepared.

The 18,000 law enforcement agencies in the United States lack the tools, personnel, and resources to respond to cybercrime effectively. State and locals have turned to federal funding to fill these gaps, but federal government grants do not prioritize combatting cybercrime.

The Justice Department (DOJ) has never identified cybercrime as an “Area of Emphasis” for their main criminal justice grant that awards state and local criminal justice agencies $400-$550 million annually.2 And while DOJ and the Department of Homeland Security (DHS) provided nearly $2 billion that state and local officials could use for cyber enforcement purposes in Fiscal Year (FY) 2019, data from DHS implies that very little is used for cybercrime. Only 2% of all DHS preparedness grant programs were used for all cybersecurity needs in FY 2019.3 Moreover, just three grants in FY 2019 were solely dedicated to cybercrime with a total budget of $12.7 million.4

# 1AR---Fullertown R6

## Case

### 1AR---AT: AI Link

#### Bureaucracy and technocracy are critical to materially improving lives---rejection devolves into hopeless idealism that has no mechanism to affect the distribution of resources that determine how people live their lives

Piliavsky 17 – Anastasia Piliavsky, Professor of Anthropology, University of Cambridge, “The wrong kind of freedom? A Review of David Graeber’s The Utopia of Rules: On Technology, Stupidity and the Secret Joys of Bureaucracy,” *International Journal of Politics, Culture, and Society*, Volume 30, Issue 1, March 2017, pp. 107-111

Bureaucracy, Graeber tells us, has swallowed the modern world whole. If 40 years ago, countless pamphlets, monographs, and satirical novels denounced the horrors and absurdities of bureaucratic life, today, although the world is more bureaucratized than ever, hardly anyone any longer complains about, or even cares to notice, the fact. “It’s as if, as a planetary civilization, we have decided to clap our hands over our ears and start humming whenever the topic comes up” (p. 5). How did this happen? Graeber’s argument runs roughly like this. Modern Euro-American bureaucracy is a holdover of the ancien régime: a newly clothed, but in its essence aristocratic, hierarchy of command. Its primary role has always been the regulation, and indeed the creation, of markets by governments (an argument Graeber set out in his earlier book Debt: the first 5000 years). In the late nineteenth century, private businesses started to adopt bureaucratic techniques, with the result that governments and businesses, especially in Germany and the United States, became increasingly difficult to distinguish in their modus operandi and culture. This is how corporations were born. After World War II, the USA set up global bureaucracies—the United Nations and the Bretton Woods organizations—thus projecting bureaucracy onto a planetary scale. The American bureaucrat, and faith in the bureaucratic compulsion, has since conquered the world and the minds of its denizens.

For ordinary people around the globe, bureaucracy is not just a source of infinite tedium, it is also the cause of existential violence. It violates our capacity to imagine, create, play, or even think clearly; and in so doing it infringes upon the very essence of what it means to be human, for imagination is what raises us above other mammals, writes Graeber, citing Edmund Leach. “Bureaucratic procedures… have an uncanny ability to make even the smartest people act like idiots” (p. 95). We all know the experience of ticking boxes, which depletes the will of even the most imaginative and playful. But Graeber sees in box-ticking more than a momentary numbing of the mind: bureaucracy “radically strips down, simplifies, and ultimately prevents communication … it is really a form of anti-action” which interns the soul. Even more treacherously, the bureaucratic process deludes us into believing that its spurious rationality and impersonal quantitative techniques are sources—indeed the only viable sources—of equality, justice, and fairness in the world. This could not, however, be further from the truth. Bureaucracies are made of hierarchy and alienation, and they serve the private interests of political and economic elites. They are the “democratization of despotism” (p. 164).

Graeber is not simply whinging. His book is a manifesto with a clear political aim. What unsettles him at least as much as the iron clutch of bureaucracy is the fact that the political Left had lost its grip. As the rebellious 1960s receded into a quaint memory,

the mainstream Left has increasingly reduced itself to fighting a kind of pathetic rearguard action, trying to salvage remnants of the old welfare state… What is presented as the “moderate” Left solution to any social problems – and radical Left solutions are, almost everywhere now, ruled out tout court – has invariably come to be some nightmare fusion of the worst elements of bureaucracy and the worst elements of capitalism. It’s as if someone had consciously tried to create the least appealing possible political position.… The result is a political catastrophe… Every time there is a social crisis, it is the Right, rather than the Left, which becomes the venue for the expression of popular anger (p. 6).

Many of the book’s readers will no doubt share Graeber’s concern and be very interested in his diagnosis. What they may find less convincing is the therapy he prescribes.

In Graeber’s view, what the Left needs to consolidate its position is a critique of bureaucracy because “the Left, in its essence,” he bracingly adds, “is a critique of bureaucracy.” Its “current inability to formulate a critique of bureaucracy… is synonymous with the decline of the Left itself. Without such a critique, radical thought loses its vital center – it collapses into a fragmented scatter of protests and demands” (p. 83). “The Right, at least, has a critique of bureaucracy. It’s not a very good one. But at least it exists” (p. 6). To anyone who grew up in the Soviet Union (as I did), this will sound like an implausible claim. Surely, the Left holds the welfare state—and the bureaucracy it requires—very dear. You do not need to look to the Soviet Union to see this point. John Maynard Keynes was (at one time in his life) a top bureaucrat, and dirigisme is a decidedly Leftist system. In fact, most Left-leaning governmental practice has historically lain somewhere between Swedish welfarism and the Khmer Rouge.

But Graeber stands for a different Left. A career anarchist, he wants liberation above all; more than welfare or public healthcare, and even more than social and economic justice, of which he’s been a vociferous advocate. Graeber yearns for total liberation: liberation from government rules and regulations, from boredom and capitalism, inequality, law, corporations, tradition, and the police, and from bureaucracy’s “soulless conformity.” A young anarchist group, whose manifesto he approvingly quotes, gives voice to this yearning:

We must make our freedom by cutting holes in the fabric of this reality, by forging new realities which will, in turn, fashion us. Putting yourself in new situations constantly is the only way to ensure that you make your decisions unencumbered by the inertia of habit, custom, law, or prejudice – and it is up to you to create these situations.

Freedom only exists in the moment of revolution. And those moments are not as rare as you think. Change, revolutionary change, is going on constantly and everywhere – and everyone plays a part in it, consciously or not (pp. 96–97).

During the first two chapters the reader will find herself wavering between feeling that scales have been removed from her eyes and that conspiratorial wool has been pulled over them. But by the time we are asked to cut holes in the fabric of reality, the book begins to read like a millenarian screed.

But let’s stick with Graeber’s train of thought. What he seeks liberation from is quite clear—anything that may stifle human playfulness, imagination, and will. Less apparent is what it is for. What kind of a world lies beyond the threadbare veil of false reality spun for us by American bureaucrats? And how do we get to the other side? Graeber writes, as he does in Debt, that his ultimate aim is “a world without states and capitalism” (p. 97), a world where the iron cage of bureaucracies, and indeed any abstracted regulatory regimes, would be obsolete. This sounds rather enticing. One would never have to fill out another form, never again stand in a queue for a visa. But how do we get there? “On this point,” writes Graeber, “no one is completely sure” (ibid). “Endless improvization?” “Insurrectionary moments?” A “complex and multifaceted revolutionary process?”

Meanwhile, most of us need to eat, dress, live somewhere and, therefore, work. Some of us may need to take trains to work. Now, if you needed to take a train, would you or would you not prefer it to run on time? It may well be that Graeber does not like or need to take trains. Since he tells us that he does not drive a car, it may be that he is waiting for flying cars to come onto the market. (In chapter 2, he is genuinely aggrieved that, despite what he was told in the 1960s, there are still none around.) But it is difficult to imagine how a set of generalized services that require coordination—a railway system, a postal service, a network of hospitals—can work without abstracted procedures and rules. Can they operate on the “principles of direct democracy according to an elaborate… form of consensus process,” which Graeber practiced as a member of the New York Direct Action Network (DAN) (p. 84)? DAN may well be “the best organized force” ever encountered by the NYPD (p. 85), but an amusing incident gives a sense of the organizational perils of direct democracy.

DAN did not have much of a budget, but one day, someone gave them a car, an event that precipitated a serious crisis of coordination and responsibility. In the US cars can be legally owned only by individuals or corporations, who are responsible for insuring, registering them, and paying fines. As DAN was neither an individual nor a corporation, one of its members volunteered to act as the car’s legal owner. Very soon, this brave soul became responsible for insurance fees, multiple fines and for retrieving the car when somebody else in the group had it impounded, and life became rather a nightmare. Failing to agree on how to deal with these problems, DAN decided to throw a party at which guests could smash the car with a sledgehammer, for a fee. Graeber writes that American law, with its narrow definition of ownership and ascription of responsibility, was at fault. But to me it seems that the group’s “elaborate consensus process” made it impossible to agree on who should do what, for whom, how, and when. Car smashing is a fine anarchist spectacle. Cathartic though this may be, it leaves behind only pieces that someone else needs to clean up. This liberation theology no doubt carries some psychological appeal—at least for those “of us [who] would like to smash a bank or [a] shopping mall at least once in our lives” (p. 213)—but it is difficult to see how it can add up to a coherent political outlook, let alone a political strategy.

Psychology has much to answer for here. Again and again, Graeber hangs his polemic on supposedly universal psychological states, like boredom or anxiety, which all humans supposedly abhor. Why is bureaucracy bad for us? It is because it makes us bored. Why does it nonetheless offer “secret joys?” It is because by making rules explicit, it removes the anxiety of living with ambiguous, unspoken rules. What good would removing bureaucracy do? It would liberate our minds for the fun and the play that we yearn for. For a serious social anthropologist like Graeber, this is an odd approach to adopt. Surely, not all humans—including Americans and Brits—shape their political purposes through the categories of “fun,” “angst,” or “boredom.” Many rituals studied by anthropologists around the world involve long hours of waiting and isolation, repetitive gestures, and incantations lasting hours, days, or even weeks. Yet no one—neither the anthropologists nor their informants—gets bored. Rituals are worth the wait because they do important work in society. They turn children into adults, and corpses into ancestors; they forge and sever relations, create and dissolve communities, affirm and shift loyalties, and they may even spark revolts.

Bureaucratic processes do the same kind of work. To be alive in a socially meaningful sense, it is not enough to emerge from your mother’s womb; to be dead, it is not enough to die physically. To stand for elections or vote, it is not enough to know about a country’s politics, nor is it enough to live somewhere to be a resident of that place. Who we are (alive, married, doctors, or students) and what we have (cars, children) depends on these facts being bureaucratically inscribed. The Indian Association of the Dead, whose 20,000 undead citizens have been falsely registered as deceased, fight to be recognized as living. Meanwhile, a dead candidate, whose death was not registered, recently won an election. Insofar as bureaucratic procedures perform transformative work through formalized and abstracted gestures and rules, it makes good sense for anthropologists to think of them as socially constitutive rituals.

Graeber recognizes that paperwork “actually effects change” (p. 50), but he does not want to take its social productivity seriously, the way he did with debt in his earlier book. While “traditional rituals”—Bemba female initiation or Balinese cockfights—are “infinitely rich” and “open-ended,” he insists that paperwork is “designed to be maximally simple and self-contained.” It “doesn’t really open on anything outside itself”; it is a “vacuum,” even an “abyss,” and so “there isn’t very much to interpret” (pp. 52–53). One may well feel vacuous or abysmal in the face of an interminable visa application or an Ethics Approval Form. But the sizeable anthropological literature on bureaucracy, and Graeber’s own account of his bureaucratic adventures, show that there is nothing simplistic or hollow, nothing that would encourage “thin description” or generate writing too dull to read. If it was good enough for Gogol and Kafka, surely it is good enough for us. Only someone who has accepted Weber’s ideal type as a fact of life would think that bureaucracy is inherently dull.

If, as Graeber (no doubt rightly) suggests, in the experience of many ordinary people, bureaucracy is a game—with rules and regulations, prizes, disqualifications, and arbiters—there is a world of difference between bureaucratic rules and how people play by them. It may be that the American clerks Graeber dealt with saw fastidious adherence to rules as their chief virtue, but much bureaucratic practice in the world is much more creative: self-aware, tactical, and even strategic. Few bureaucrats I have known in my life on four continents (including Europe and North America) think of themselves primarily as mere custodians of correct procedure.

I once tried to extend my research visa in a remote area of India. The clerk in the local visa office was visibly displeased: he was large, it was August, and the Desert Cooler was not coping well. He told me that I could secure my extension only in Delhi, not here. His no really meant no. Did the rulebook really require me to travel to Delhi or was he just making that up? Was this bureaucratic harassment because it was hot, because his boss was out today, or because he was fed up with helping rich, hapless white people? Whether or not one can fulfill one’s bureaucratic needs depends largely on who happens to be at the desk and how much they like you. I have charmed my way through many bureaucratic scenarios, and all it usually took was the knowledge of local language and a couple of jokes, never a bribe.

Only rarely were my encounters with Indian bureaucrats impersonal. More often, they were filled with sympathies, purposes, and interests. I will never know whether my various extensions and permits were granted with the help of clerks who chose to overlook rules in my favor or whether I would have got them faster if they “just followed the rules.” What I do know is that the Indian (and not only Indian) bureaucrats of all stripes are proud sovereigns of their domains—as masterful at circumventing the rules as at making them up—and that without their good will, your bureaucratic wishes will never come true. Their work is full of political, economic, and even moral imagination, and it pursues purposes that are anything but abstract. For them and their petitioners, it is a complicated, and often highly personal, game that relies on a calculus of written rules, but cannot be reduced to it.

Bureaucracies, from ancient Mesopotamia to Xi Jinping’s China, carry emphatic dangers and sometimes appear in hideous form, but they have also made it possible to coordinate social life on a large scale since the invention of writing. Graeber can hope to wish bureaucracy away, but by swapping regulation for autonomy, free choice, and the primacy of individual judgment, he risks collusion with libertarians and the Right.

## K

### 1AR---AT: Warming !

#### Warming irreversible – only cap solves through CCS and a bridge to renewables

Graciela 16 – Professor of Economics and of Statistics at Columbia University and Visiting Professor at Stanford University, and was the architect of the Kyoto Protocol carbon market (being interviewed by Marcus Rolle, freelance journalist specializing in environmental issues and global affairs, “Reversing Climate Change: Interview with Graciela Chichilnisky,” http://www.globalpolicyjournal.com/blog/01/09/2016/reversing-climate-change-interview-graciela-chichilnisky)

GC: Green capitalism is a new economic system that values the natural resources on which human survival depends. It fosters a harmonious relationship with our planet, its resources and the many species it harbors. It is a new type of market economics that addresses both equity and efficiency. Using carbon negative technology™ it helps reduce carbon in the atmosphere while fostering economic development in rich and developing nations, for example in the U S., EU, China and India. How does this work? In a nutshell Green Capitalism requires the creation of global limits or property rights nation by nation for the use of the atmosphere, the bodies of water and the planet’s biodiversity, and the creation of new markets to trade these rights from which new economic values and a new concept of economic progress emerges updating GDP as is now generally agreed is needed. Green Capitalism is needed now to help avert climate change and achieve the goals of the 2015 UN Paris Agreement, which are very ambitious and universally supported but have no way to be realized within the Agreement itself. The Carbon Market and its CDM play critical roles in the foundation of Green Capitalism, creating values to redefine GDP. These are needed to remain within the world’s “CO2 budget” and avoid catastrophic climate change. As I see it, the building blocks for Green Capitalism are then as follows; (1) Global limits nation by nation in the use of the planet’s atmosphere, its water bodies and biodiversity - these are global public goods. (2) New global markets to trade these limits, based on equity and efficiency. These markets are relatives of the Carbon Market and the SO2 market. The new market create new measures of economic values and update the concept of GDP. (3) Efficient use of Carbon Negative Technologies to avert catastrophic climate change by providing a smooth transition to clean energy and ensuring economic prosperity in rich and poor nations. These building blocks have immediate practical implications in reversing climate change and can assist the ambitious aims of Paris COP21 become a reality. MR: What is the greatest advantage of the new generation technologies that can capture CO2 from the air? GC: These technologies build carbon negative power plants, such as Global Thermostat, that clean the atmosphere of CO2 while producing electricity. Global Thermostat is a firm that is commercializing a technology that takes CO2 out of air and uses mostly low cost residual heat rather than electricity to drive the capture process, making the entire process of capturing CO2 from the atmosphere very inexpensive. There is enough residua heat in a coal power plant that it can be used to capture twice as much CO2 as the plant emits, thus transforming the power plant into a “carbon sink.” For example, a 400 MW coal plant that emits 1 million tons of CO2 per year can become a carbon sink absorbing a net amount of 1 million tons of CO2 instead. Carbon capture from air can be done anywhere and at any time, and so inexpensively that the CO2 can be sold for industrial or commercial uses such as plastics, food and beverages, greenhouses, bio-fertilizers, building materials and even enhanced oil recovery, all examples of large global markets and profitable opportunities. Carbon capture is powered mostly by low (85°C) residual heat that is inexpensive, and any source will do. In particular, renewable (solar) technology can power the process of carbon capture. This can help advance solar technology and make it more cost-efficient. This means more energy, more jobs, and it also means economic growth in developing nations, all of this while cleaning the CO2 in the atmosphere. Carbon negative technologies can literally transform the world economy. MR: One final question. You distinguish between long-run and short-run strategies in the effort to reverse climate change. Would carbon negative technologies be part of a short-run strategy? GC: Long-run strategies are quite different from strategies for the short-run. Often long-run strategies do not work in the short run and different policies and economic incentives are needed. In the long run the best climate change policy is to replace fossil fuel sources of energy that by themselves cause 45% of the global emissions, and to plant trees to restore if possible the natural sources and sinks of CO2. But the fossil fuel power plant infrastructure is about 87% of the power plant infrastructure and about $45-55 trillion globally. This infrastructure cannot be replaced quickly, certainly not in the short time period in which we need to take action to avert catastrophic climate change. The issue is that CO2 once emitted remains hundreds of years in the atmosphere and we have emitted so much that unless we actually remove the CO2 that is already there, we cannot remain long within the carbon budget, which is the concentration of CO2 beyond which we fear catastrophic climate change. In the short run, therefore, we face significant time pressure. The IPCC indicates in its 2014 5th Assessment Report that we must actually remove the carbon that is already in the atmosphere and do so in massive quantities, this century (p. 191 of 5th Assessment Report). This is what I called a carbon negative approach, which works for the short run. Renewable energy is the long run solution. Renewable energy is too slow for a short run resolution since replacing a $45-55 trillion power plant infrastructure with renewable plants could take decades. We need action sooner than that. For the short run we need carbon negative technologies that capture more carbon than what is emitted. Trees do that and they must be conserved to help preserve biodiversity. Biochar does that. But trees and other natural sinks are too slow for what we need today. Therefore, negative carbon is needed now as part of a blueprint for transformation. It must be part of the blueprint for Sustainable Development and its short term manifestation that I call Green Capitalism, while in the long run renewable sources of energy suffice, including Wind, Biofuels, Nuclear, Geothermal, and Hydroelectric energy. These are in limited supply and cannot replace fossil fuels. Global energy today is roughly divided as follows: 87% is fossil, namely natural gas, coal, oil; 10% is nuclear, geothermal, and hydroelectric, and less than 1% is solar power — photovoltaic and solar thermal. Nuclear fuel is scarce and nuclear technology is generally considered dangerous as tragically experienced by the Fukushima Daichi nuclear disaster in Japan, and it seems unrealistic to seek a solution in the nuclear direction. Only solar energy can be a long term solution: Less than 1% of the solar energy we receive on earth can be transformed into 10 times the fossil fuel energy used in the world today. Yet we need a short-term strategy that accelerates long run renewable energy, or we will defeat long-term goals. In the short term as the IPCC validates, we need carbon negative technology, carbon removals. The short run is the next 20 or 30 years. There is no time in this period of time to transform the entire fossil infrastructure — it costs $45-55 trillion (IEA) to replace and it is slow to build. We need to directly reduce carbon in the atmosphere now. We cannot use traditional methods to remove CO2 from smokestacks (called often Carbon Capture and Sequestration, CSS) because they are not carbon negative as is required. CSS works but does not suffice because it only captures what power plants currently emit. Any level of emissions adds to the stable and high concentration we have today and CO2 remains in the atmosphere for years. We need to remove the CO2 that is already in the atmosphere, namely air capture of CO2 also called carbon removals. The solution is to combine air capture of CO2 with storage of CO2 into stable materials such as biochar, cement, polymers, and carbon fibers that replace a number of other construction materials such as metals. The most recent BMW automobile model uses only carbon fibers rather than metals. It is also possible to combine CO2 to produce renewable gasoline, namely gasoline produced from air and water. CO2 can be separated from air and hydrogen separated from water, and their combination is a well-known industrial process to produce gasoline. Is this therefore too expensive? There are new technologies using algae that make synthetic fuel commercially feasible at competitive rates. Other policies would involve combining air capture with solar thermal electricity using the residual solar thermal heat to drive the carbon capture process. This can make a solar plant more productive and efficient so it can out-compete coal as a source of energy. In summary, the blueprint offered here is a private/public approach, based on new industrial technology and financial markets, self-funded and using profitable greenmarkets, with securities that utilize carbon credits as the “underlying” asset, based on the KP CDM, as well as new markets for biodiversity and water providing abundant clean energy to stave off impending and actual energy crisis in developing nations, fostering mutually beneficial cooperation for industrial and developing nations. The blueprint proposed provides the two sides of the coin, equity and efficiency, and can assign a critical role for women as stewards for human survival and sustainable development. My vision is a carbon negative economy that represents green capitalism in resolving the Global Climate negotiations and the North–South Divide. Carbon negative power plants and capture of CO2 from air and ensure a clean atmosphere together innovation and more jobs and exports: the more you produce and create jobs the cleaner becomes the atmosphere. In practice, Green Capitalism means economic growth that is harmonious with the Earth resources.

### 1AR---Fwk

#### It’s a cookie-cutter over simplification to say that all scholarship or all subjectivity is neoliberal – it elides the nuance necessary to win the alt

Watts 21 [Galen Watts is Guest Professor with Special Appointment and Banting Postdoctoral Fellow, based at KU Leuven, “Are you a neoliberal subject? On the uses and abuses of a concept” 8-6-2021 Sage Journals]

On neoliberalism (4): What is a ‘neoliberal subject’?

Admittedly, scholarship on ‘neoliberal subjects’ varies in its theoretical sophistication and empirical support. Moreover, as social scientists have become increasingly familiar with the theoretical frameworks informing neoliberalisms (2) and (3), the number of empirical studies making use of one or both of these conceptions has grown exponentially. So, let me be clear: in what follows, my concern is with a particular type of social scientific scholarship on neoliberalism (4) and the distinct errors and oversimplifications it perpetrates. What distinguishes this type of scholarship is that it seeks not merely to critique the ideal typical notion of a ‘neoliberal subject’ (as defined by neo-Marxists and/ or Foucaultians), but also to demonstrate empirically the extent to which either/both neoliberalisms (2) and (3) have successfully penetrated into the psychic and embodied lives of actual individuals, by means of three discursive criteria: within this scholarship, neoliberal subjects are (a) those who invoke the language of personal responsibility or have been ‘responsibilized’; (b) those who value autonomy and speak in the language of individualism; and (c) those who employ the rhetorics of authenticity and selfrealization, and who conceive of their self as a thing to be worked on and improved. The problem with these criteria, we shall see, is that they are excessively broad, multivalent and insufficient to prove what they purport to.

Personal responsibility and responsibilization. Sociologists seem to agree on the ‘centrality of the discourse of personal responsibility in the neoliberal era’ (Foster, 2016, p. 94). As Luxton (2010, p. 180) illustratively remarks in Neoliberalism in Everyday Life, ‘The extent to which people accept personal responsibility both reveals the depth to which neoliberal ideologies have penetrated personal life and shows the centrality of such ideologies for the success of neoliberalism’. Indeed, if one had to boil what it means to be a ‘neoliberal subject’ down to a single concept, ‘responsibilization’ – the process whereby individuals are ‘made responsible’ for their choices and actions, while the state increasingly surrenders responsibility for their health, economic security and well-being – would be a legitimate candidate. Across a range of studies, scholars claiming allegiance to either/both neo-Marxist and Foucaultian theoretical traditions more and more interpret invocations of ‘personal responsibility’ as evidence of ‘neoliberalism’. For instance, in her analysis of the popular memoir Eat, Pray, Love, authored by Elizabeth Gilbert, Williams (2014, p. 620) finds in the book’s pages what she refers to as a ‘neoliberal spiritual subject’ on the grounds that this subject ‘is held responsible for putting in the “work” necessary to be happy and healthy’. And paying homage to Foucault, Williams writes that reading Gilbert’s popular memoir calls to mind ‘the neoliberal vision of the individual as entrepreneur of the self’ (2014, p. 625). Similarly, in his study of mindfulness programs in UK schools, Reveley (2016, p. 498, p. 499) draws on a synthesis of neo-Marxist and Foucaultian approaches, which he argues hold that ‘neoliberalism’s ideological correlates are personal autonomy, self-reliance, and responsibility’ in order to make the case that these programs responsibilize individual subjects because they make them ‘responsible for their own emotional well-being’. Reveley (2016, p. 498) further contends that mindfulness ‘is a practical technique that transmits the neoliberal self-responsibilizing impulse down to young people’. And in her study of Mexican migrants participating in an English language program, Ullman (2012, p. 463), drawing explicitly on the work of Harvey and Rose, argues that because her study participants view learning English as their own personal responsibility, they are repeating a ‘neoliberal mantra’. While I do not doubt the affinities between neoliberalisms (1), (2) and (3) and the rhetoric of personal responsibility, there are real problems with using the existence of the latter as evidence of the former. For one, there is nothing inherently ‘neoliberal’ about the discourse of personal responsibility, given its semantic approval by a whole gamut of other ideologies and political rationalities – be they, conservative, communitarian, civic republican and social democratic. Indeed, personal responsibility is a deeply entrenched value in democratic societies, widely considered integral to being a moral agent (Mounk, 2017, p. 160). For another, scholars have shown that in many texts alleged to disseminate ‘neoliberal discourse’, there often exist alternative conceptions of responsibility at play (e.g. Trunka & Trundle, 2014; Sletto & Nygren, 2016). Of course, an objection might be that whether or not individuals subscribe to alternative conceptions of responsibility, the fact of neoliberalism (1) cannot be dismissed. In other words, processes of responsibilization are taking place and these conditions force individuals to ‘become responsible’, regardless of their convictions. There is undoubtedly truth in this. As the Welfare State has been dismantled, leaving populaces increasingly unprotected and insecure, individuals have done what any and all humans do in the face of change: adapt. Thus, it is reasonable to conjecture that in order to ‘get by’ in these precarious times, we must become, to some extent, self-responsible subjects and furthermore, that reading Eat, Pray, Love, learning to practice mindfulness and accepting responsibility for learning English in some sense encourages and bolsters this process. Yet, even if the above story is correct, it is still not the case that what we end up with are going to be ‘neoliberal subjects’ if by this we mean something that bears some clear relation to neoliberalism (2), or even neoliberalism (3). Recall that neoliberalism (2) presumes a degree of popular, if alienated, consent; neoMarxist scholars presume that neoliberal ideology exists as doxa, in Bourdieu’s sense, informing common-sense understandings. But as Davies (2014, p. 316) remarks, there is a heated debate ‘as to whether neoliberalism is “alive,” “dead” or in some paradoxical “zombie” state’. While Don Kalb (2012, p. 319) contends that ‘neoliberalism, in whatever hybrid or even “parasitic” ... form, appears as less intellectually convincing, popularly legitimate, and more openly and radically confronted than ever in the last three decades’. In agreement, I would argue that neoliberal ideology is, in fact, extremely contested and actually not widely adhered to by ordinary citizens (even in the most ‘neoliberal’ country – America (see Saad, 2019)), so it seems unwarranted to treat the mere fact of adaptation as evidence of a wholesale embrace of neoliberal ideology. Indeed, we need to make space for the distinction proposed by Hilgers between ‘neoliberal dispositions’ and ‘dispositions produced by neoliberalism’ (2013, p. 85). But what of neoliberalism (3)? Arguably these case studies offer clear instances of neoliberal discourses and governmental technologies, which encourage individuals to become ‘entrepreneurs of the self’. But can we even say this much? Recall that, for Foucault, the new homo oeconomicus is the ultimate market actor, one who seeks opportunities for self-investment at every turn. It seems to me that this is patently not what we find in these case studies – or, more charitably, the evidence for this claim is rather weak. For why should we assume with Williams and Reveley that thinking one should bear some responsibility for one’s health and happiness is necessarily evidence of neoliberal reason? This stretches the notion of homo oeconomicus beyond anything resembling what one finds in Foucault’s writings. Or, consider how Ullman goes about identifying the ‘neoliberal mantra’ of the Mexican migrants she studied. One of her interviewees, Raul, informed her that he had a ‘failure of the will/una falta de voluntad’ because he only watched an hour of the English language program he had purchased. When asked why he did this, Raul responded that ‘it was boring’ (Ullman, 2012, p. 463) Ullman interprets this as follows: ‘This interpretation takes the program itself, its quality and the effectiveness of its pedagogical approach, out of the conversation, and makes learning English solely an individual responsibility’ – which, in Ullman’s view, is clearly ‘neoliberal’ (2012, p. 463). But is this conclusion justified? Is it really ‘neoliberal’ to feel one has failed personally because one got bored and failed to do one’s homework? Again, this is a long way from the figure of homo oeconomicus identified by Foucault. Still, there is another claim, implicit in Ullman’s analysis, which is worthy of consideration, as it has become increasingly common: discourses are allegedly ‘neoliberal’ to the extent that they obscure the structural dimensions of social life – that is, to the extent that they are methodologically individualistic.

Autonomy and individualism. Next to the discourse of personal responsibility, scholars tend to zero in on the language of autonomy and individualism as proof of ‘neoliberal subjectivity’. In fact, processes of responsibilization and ‘autonomization’ are generally considered discursively tethered, if not complementary. For instance, in their analysis of Norwegian and Turkish media discourse, Tu¨rken et al. (2016, p. 37), drawing on the work of Foucault and Rose, identify the normalization of ‘a responsible subject who needs “self-control” in order to “take charge of” and “to be able to live life”’ They write, ‘Different voices in our data discursively construct the individual as an autonomous subject who is encouraged to “take action”, “take personal responsibility”, and “work hard” to achieve a “happy life” (2016, pp. 37–38), thereby concluding that mainstream media discourse in these countries serves to disseminate ‘neoliberal thinking’ (2016, p. 35). In their study of psychotherapeutic discourse Lamarre et al. (2019, p. 239) write, ‘Neoliberal governmentality can be seen as a “conduct of conduct” (Foucault, 2008) or a strategic creation of a specific form of subjectivity’ (p. 239). They argue that psychotherapeutic discourse normalizes and produces this ‘normative neoliberal subjectivity’ which they characterize as ‘autonomous, freely choosing subjects continuously involved in self-improvement’ (2019, p. 244). They conclude, ‘Psychotherapy is inevitably informed by and potentially further perpetuates neoliberal ideology’ (Lamarre et al., 2019, p. 242). And in his study of ‘workplace spirituality’, invoking a synthesis of neoMarxist and governmentality approaches, LoRusso (2020, p. 6) contends that workplace spirituality is a ‘technology of the self’ which ‘produces the quintessential capitalist subject, a radically individualist subject for whom reality is itself merely the results of individual choices about how it is to be experienced’. Thus, for LoRusso, what makes ‘spirituality’ neoliberal is the fact that it promotes a ‘program of individual rather than social change’ (LoRusso, 2017, p. 68). Now, just as with the blanket condemnation of ‘personal responsibility’, the problem with automatically subsuming the language of autonomy and individualism under the conceptual umbrella of ‘neoliberalism’ is that it ignores Durkheim’s (1969) key insight that individualism is both a collective and polyvalent discourse, holding widely divergent consequences depending on how it is interpreted. Indeed, it is well established within sociology that there exist multiple individualisms, rooted in distinct cultural traditions (Bellah et al., 1985). Thus, as Barnett (2005, p. 11) fittingly cautions, by subsuming all individualistic rhetoric under the category ‘neoliberalism’ scholars theorize out of sight alternative political rationalities that, while wedded to the value of individual autonomy, may conceptualize this ideal in quite different ways. Moreover, as cultural sociologists have shown, individuals adopt different technologies, devices and discourses in different contexts, adapting them to their particular aims and present circumstances (Swidler, 1986). So, while it might be true that, in some instances, individuals invoke a methodologically individualistic discourse which exalts the individual over the social, it is theoretically naı¨ve to suppose that, by necessity, this discourse is always and everywhere invoked by said individual. As Scharff (2016, p. 115) remarks, ‘entrepreneurial discourses are negotiated in contexts that provide a range of discourses’. Accordingly, it seems reasonable to question any necessary connection between individualistic talk and endorsement of neoliberalism (2). Still, could we not plausibly interpret these case studies as instances of neoliberalism (3)? That is, as genealogical attempts to trace the forms of neoliberal reason underlying the governmental technologies and discourses of media, psychotherapy and workplace spirituality? Much as before, it is not clear that what we find in these case studies is in fact the kind of neoliberal reason of which Foucault has written, since mere talk of individual autonomy and free choice is insufficient evidence of homo oeconomicus. But even were we to accept this claim, it seems to me that these case studies do not actually limit themselves to neoliberalism (3), but rather make the leap to neoliberalism (4). The shift from neoliberalism (3) to neoliberalism (4) is subtle, but significant. It is characterized by a shift from the genealogical and textual analyses of Foucault and early governmentality scholars like Rose – which sought merely to chart the emergence of new discourses and associated technologies – to empirical analyses of how these discourses and technologies are allegedly internalized by actual subjects. Again, Foucault did not conceive of homo oeconomicus as a real empirical subject. Moreover, early governmentality scholars did ‘not suppose that governmental rationalities automatically determine subjectivities’ (Barnett et al., 2008, p. 629), nor did they concern themselves with the way specific discourses or technologies are implemented, adopted or refused by actual persons (Rose et al., 2006, p. 100). However, this epistemic humility has become increasingly rare in recent years – as these case studies aptly illustrate. For instance, Lamarre et al. write, ‘Following poststructuralist lines of thought, we might understand the power of the neoliberal capitalist state as both restrictive and Watts 11 productive, but always shaping what we know and how we know ourselves to be’ (2019, p. 239, emphasis added). While LoRusso maintains that, ‘At the individual level, these discourses penetrate, possess, and produce the expectations and dispositions of persons’ such that workplace spirituality ‘reshapes employees into willing participants in a neoliberal social order’ (LoRusso, 2020, p. 23, 13, emphasis added). Interestingly, Tu¨rken et al. (2016, p. 43) are more cautious. They conclude their study: ‘Although media is a powerful tool to disseminate meaning and thereby influence subjectivity in society, people do negotiate their own understandings and may even oppose media’s positioning of subjecthood’, adding, ‘The present study does not investigate how media discourse on self-development is negotiated by the readers’. And yet, after noting this critical and consequential limitation of their research, only a few lines below they boldly assert a claim for which they have provided little actual evidence: ‘the dominant individualistic subject of contemporary society is reproduced and refashioned as an entrepreneur of herself’ (Tu¨rken et al., 2016, p. 44). Accordingly, for these scholars, the homo oeconomicus identified by Foucault is no longer a mere speculative fiction of the human capital theorist’s making, but allegedly captures the psychic and embodied life of the majority of people in the twenty-first century.

The problem is that this methodological leap – from neoliberalism (3) to neoliberalism (4) – is frequently not warranted. As Tu¨rken et al. would admit, discourse analysis of media articles, psychotherapeutic manuals and workplace spirituality texts does not provide us with a transparent window into the psychic lives of individuals – what many accounts of ‘neoliberal subjectivity’ claim to have accessed. Indeed, the presumption that ‘publicly observable rationalities, procedures and techniques of state and non-state actors can be read as proxies for processes of subject-formation’ is simply untenable (Barnett et al., 2008, p. 626). And as Scharff (2016, p. 108) usefully reminds us, ‘there has been little empirical research that explores the contours of entrepreneurial subjectivity and, even more specifically, its psychic life’.

Here, then, we confront the gap between neoliberalism (3) and neoliberalism (4): It is one thing to identify discourses, technologies and apparatuses – it is something else entirely to contend that they actually induce subject-formation (Barnett, 2005, p. 10). Now, this is not to say that neoliberalism (3) cannot lead to neoliberalism (4). On the contrary, I do not doubt that neoliberal discourses have been internalized by some, shaping their behaviour and self-understanding. But the fact of the matter is these representative studies provide little evidence to show this. Furthermore, other empirical studies make clear that the story is far more complicated, involving processes of discursive contestation and refusal which are too often ignored. For instance, upon conducting interviews with freelance journalists about how they respond to popular ‘personal branding’ discourses within their industry, Vallas and Christin (2018, p. 24) found that ‘interviewees respond to entrepreneurial discourse in a multiplicity of ways, defying characterization in simple or uniform terms’. They also found that national cultural repertoires, occupational norms and the degree of material precarity experienced by these journalists considerably shapes the extent to which they become the ‘enterprising self’ naturalized in neoliberal reason (Vallas & Christin, 2018, p. 28). And in his qualitative study of how middle-class individuals read self-help books, Lichterman (1992, p. 422) writes, ‘They read books ambivalently, and in ongoing relation to other frameworks for situating personal selfhood in a social context’, thereby concluding, ‘We can not assume in advance that we know how strong or how unified an ideological message it is that self-help book readers read out of their self-help books’ (1992, p. 423). Houghton usefully explicates the implications that follow from these insights:

This difference between the actual and the ideal is a point that is at times forgotten in Foucauldian accounts of subjectivity: the extent to which individuals become a certain type of subject is always an empirical question, hence the need for empirical research. So, while we can talk of neoliberal subjects, this is not to say agents will operate exclusively through that frame. (Houghton, 2019, p. 622)

Ironically, while this might be typical of contemporary ‘Foucaultian accounts of subjectivity’, they actually conflict with the work of Foucault himself. As Green (2010, p. 318) notes, in his mature work Foucault endorsed the view that ‘disciplinary power is both more complex in its effect and perhaps less effective in subjectification than proposed by popular post-structural approaches’. It would seem, then, that even Foucault would have had trouble accepting much scholarship that claims to have identified neoliberalism (4).

Authenticity and self-realization. According to many sociologists, the ‘entrepreneurialization of subjectivity’ (Christiaens, 2019, p. 95) veils itself most conspicuously behind the language of authenticity and self-realization. The idea is that to speak, as so many today do, of the importance of ‘realizing one’s potential’, ‘improving oneself’ and ‘seeking personal growth’, is to have subjected oneself to neoliberal governmentality. To give some examples: in his analysis of the emerging discipline of Happiness Studies Binkley (2011, p. 383), an avowed disciple of Foucault, contends that ‘the current discourse on happiness’ serves as a technology of ‘neoliberal subjectification’. He writes, ‘To govern oneself through the maximization of one’s potential for happiness is to govern oneself as a subject of neoliberal enterprise’ (2011, p. 340). In their analysis of self-help discourse, Erjavec and Volcic (2009, p. 139), citing Wacquant and other neo-Marxists, critique ‘the (neo)liberal imperative of constant retraining, a “just-keep-on-learning” mentality, selfdevelopment and individual responsibility’. And in her study of contemporary spirituality, Altglas (2018, p. 87), drawing on Foucault and Rose, writes that ‘Spirituality’ entails ‘accepting the necessity for the individual to commit to a process of change, learning, and progress – what “spiritual seekers” and their teachers call “working on oneself”‘. She concludes, ‘Spirituality as self-discipline and the kind of self it celebrates... constitutes a particular way to exert power in affinity with neoliberalism’s political and economic mechanisms of privatisation’ (2018, p. 95). The notion that the rhetorics of authenticity and self-realization signal a ‘neoliberal subject’, while theoretically provocative, is problematic. For one, as Laidlaw (2015, p. 913) reminds us, ‘The idea of taking the self as a project of self-discovery in the West goes back at least to Stoicism and has been there in Asia in Buddhism and Confucianism for centuries’. In fact, the conviction that each individual has a potential that is unique to them, and that it is their life’s vocation to realize this is arguably constitutive of the modern identity (Taylor, 1989). So, why should we assume that maximizing one’s Watts 13 potential for happiness, a ‘keep-on-learning’ mentality, or continually seeking to develop one’s self are distinctly ‘neoliberal’? There seems to me no necessary connection between these qualities and endorsement of neoliberalism (2). Nor do I see a necessary connection between these features and the ‘entrepreneur of the self’ naturalized in human capital theory. Again, one potential response is that I have made an error in presuming that these scholars do, in fact, assume the success of these technologies and discourses in constituting or subjectifying actual individuals. Perhaps their only concern is with the governmental technologies and discourses themselves. That is, perhaps they are not endorsing neoliberalism (4), but rather limiting their analyses to neoliberalism (3). On this modified account, the claim would be that positive psychology, self-help and spiritual books function as technologies and devices of neoliberal governmentality, which naturalize ‘neoliberal discourse’, given their naturalization of the ideal of a self-responsible, autonomous and self-realizing subject. While this claim may be more modest, it is still not without issues. And the reason for this is that it is not merely neoliberalism which presupposes and prescribes the ideal of a self-responsible, autonomous and self-realizing subject, but that this has also been a staple of liberalism since its inception, given its critique of excessive government (Burchell, 1993). Indeed, it is for precisely this reason that Rose made sure to distinguish between ‘neoliberalism’ – which he views as a ‘highly specific rationality’ (Rose et al., 2006, p. 97) – and ‘advanced liberalism’ – which he views as ‘something with a more general salience, which underpins mentalities of government from all parts of the political spectrum’ (Rose, 1996, p. 60). In other words, according to Rose, while a neoliberal programme may well find alignment with advanced liberal forms of rule, it would be wrong to reduce the latter to the former. It should not surprise us, then, that Rose has offered strong words against what he refers to as

a kind of cookie-cutter typification or explanation, a tendency to identify any programme with neo-liberal elements as essentially neo-liberal, and to proceed as if this subsumption of the particular under a more general category provides a sufficient account of its nature or explanation of its existence. (Rose et al., 2006, p. 98).1

Furthermore, it is critical to note that Rose, like Foucault, has long distanced himself from the kind of socio-critique implicit in neoliberalism (2). And the reason for this is that he seems to think, given that advanced liberalism is the regnant form of political rule, we are all subject to it in one way or another (Barry et al., 1996).

Where does this leave us? I would put it this way: If we accept that neoliberalism (1) has created socio-economic conditions that have forced individuals to adapt and thereby become, to some extent, self-responsible subjects, then it might well be that all of us, simply by virtue of inhabiting these social conditions, have become ‘neoliberal subjects’. Indeed, if we accept Rose’s claim that we are all subject to advanced liberal forms of rule, then this would seem a natural corollary. However, the difficulty with this conception of ‘neoliberal subject’ is that it is not clear what ‘neoliberal’ in this instance actually means. It is clearly not neoliberalism (2), since this would entail not just adaptation, but acquiescence such that we, as individuals, had accepted the basic tenets of neoliberal 14 European Journal of Social Theory XX(X) ideology. Nor is it clear that it entails neoliberalism (3), which entails having one’s subjectivity constituted by neoliberal reason. Thus, it seems to me far more accurate to say that we are all (or most us, anyway) liberal subjects – those who, in one way or another, conceive of ourselves as self-responsible, autonomous and self-realizing subjects. Though it goes without saying that such a claim is not all that illuminating.

Conclusion

Let me be clear: I do not doubt that, in some cases, neoliberalisms (1), (2) and (3) have led to the production of actual ‘neoliberal subjects’ – that is, living breathing homo oeconomicus. For instance, I would conjecture that the world of corporate finance is probably densely populated with such subjects (e.g. Neely, 2020). And indeed, in my own research, I have found that Charismatic Christians who subscribe to ‘prosperity gospel’ approximate the ‘enterprising self’ normalized in human capital theory (Watts, forthcoming). However, I am quite sceptical of the claim that neoliberal subjects populate each and every social sphere, as if we are all in the thralls of neoliberal ideology, or govern ourselves exclusively according to the dictates of neoliberal reason. That said, this obviously remains an urgent research question. But if we are to pursue it, we require a methodological approach that is sensitive to institutional specificities, the extent to which discourses are polyvalent, and the complexities involved in the production of psychic and embodied subjectivities, not just a loose discourse analysis of governmental texts.

Why? For both academic and political reasons. First, the academic: to the extent that neoliberalisms (1), (2) and (3) exist, it only muddies the water to overinterpret them. Indeed, we would do better to practice analytic precision when labelling something (or someone) ‘neoliberal’. This is especially the case when researching across national contexts: it is simply not accurate that every citizen of Western liberal democracies is equally ‘neoliberal’, either in the sense that they adhere to neoliberal ideology or that they live according to neoliberal reason. And as a growing number of scholars have maintained, it is misleading to interpret the subjective lives of citizens of East Asia and the Global South as wholly colonized by either neoliberalisms (2) or (3) (Ferguson, 2009; Parnell & Robinson, 2012). However, even within specific national contexts, we must make sure to recognize that identities and discourses are multiple, such that mere invocations of aspects of ‘neoliberal discourse’ should not be taken as evidence of a comprehensive ‘neoliberal subjectivity’. In short, if our aim as social scientists is to capture the complexity, richness and diversity of subjective life in the twenty-first century, then we ought to broaden the ‘repertoire of subjectivity’ (Green, 2010, p. 331) carried in our analytic toolboxes.

Second, the political: for those of us who find something abhorrent about neoliberalisms (1), (2) and (3), it may actually undermine our cause to repeatedly give the impression that one or either of these have seeped into the subjectivities of everyone presently living. One reason for this is that to the extent that we overlook, or dismiss, extant alternative social and moral forms, we may unwittingly serve to bolster neoliberal ideology and reason, aiding and abetting their spokespeople in their goal of global domination. Indeed, John Welsh (2020, p. 68) suggests that if we are to oppose neoliberalism in all of its forms, academics must begin to ‘introduce contingency back into the interstices of this seemingly impenetrable edifice’. Interestingly, this strategy actually aligns with the mature work of Foucault, for whom scholarship should seek to disrupt that which is taken for granted. Drawing on this Foucaultian legacy, Cornelissen (2018, p. 144) convincingly argues that ‘resistance should be given a more prominent analytical role in the critique of neoliberalism’, adding, ‘resistance is not secondary to the elaboration of alternatives; rather, moments of refusal must guide the formulation of alternative analyses’. Cornelissen concludes, ‘what is at stake politically is our capacity to imagine practices or resistance to neoliberalism and to take seriously those modalities of resistance that already exist’. I could not agree more. And for this reason, I think we should be far more careful when invoking the monolithic notion of a ‘neoliberal subject’.

### 1AR---AT: Fascism DA

#### The aff addresses an example of uniquely violent capitalism that cloaks private entities in the power of the state

Shapiro 14 [Ilya Shapiro, Senior fellow in constitutional studies at the Cato Institute and director of the Robert A. Levy Center for Constitutional Studies, 10-20-2014 https://www.cato.org/commentary/will-real-government-crony-please-stand]

Whatever one’s opinion of antitrust law—mine isn’t too favorable because the law is typically too slow‐​acting to befit a dynamic marketplace—existing immunity doctrines are dangerous because they allow private entities cloaked in government authority to raise prices and restrict choice. Worse, state‐​established cartels frequently harm constitutional rights, such as the right to earn a living, by barring new businesses from opening. The North Carolina case is a prime example of private actors arbitrarily abusing government power to block entrepreneurs from entering an industry and providing for themselves and their families.

Occupational Licensing Laws Are a Government Racket

As George Will put it in his recent column on the case, occupational licensing laws and the monopoly power they grant “are growth‐​inhibiting and job‐​limiting, injuring the economy while corrupting politics. They are residues of the mercantilist mentality, which was a residue of the feudal guild system, which was crony capitalism before there was capitalism. Then as now, commercial interests collaborated with governments that protected them against competition.”

Cato and PLF filed a Supreme Court brief supporting the FTC—you know it’s a bad case when we’re on the federal government’s side!—arguing that courts should only rarely immunize private parties who act on government’s behalf. The Fourth Circuit was not only correct in applying the “active supervision” requirement, but existing immunity doctrines are too lax.

Instead, courts should grant antitrust immunity to private entities acting under state law only where state law commands their restraint on competition, and where that restraint substantially advances an important state interest. This test would help protect the constitutional right to economic liberty against the only entity that can normally create monopolies and yet which today enjoys immunity from antimonopoly laws: the government.

### 1AR---AT: Bubble

#### No debt bubble---the risk is overstated and history massively disproves it

Kejriwal 16—Aradhana Kejriwal, Chief Investment Officer at JOYN Advisors, CFA Institute, September 15th, “Sovereign Debt Crisis: Is A Big Default Coming?” *JOYN Financial Advisors*, https://joynadvisors.com/sovereign-debt-crisis/

While concerns over emerging market economies is understandable, some investors are concerned that countries in the developing world – especially the US and Japan – won’t be able to fully meet their debt obligations and a default (or perhaps even a potential default) might trigger a debt crisis among these global economies and create havoc in the markets. We address these fears next. We’re not worried about U.S. defaulting on its debt even though U.S. debt has ballooned The main reason for our conviction is our currency – the “almighty” US dollar. The dollar continues to have a firm grip on its status as a safe haven for investors. As crises develop elsewhere, its value among investors is elevated even more. The US government always has the fallback option of printing more money to pay its debt as the dollar’s value seems undiminished in the global economy. The dollar continues to hold credibility in the world. We owe a significant portion of our debt to ourselves and foreign debt holders. The only way such a colossal default would be possible would be if the US dollar experienced a massive devaluation, spiraling the world economies into a colossal economic depression. Such a scenario likely would make the Great Depression seem like a mere ripple by comparison. As no debtholders would want to risk such a global economic cataclysm, credit likely would be extended, in near perpetuity if need be – and thus the game continues. WHO DOES THE U.S. GOVERNMENT OWE MONEY TO? US debt is still considered a safe haven. Despite investor concerns, US Treasury debt remains one of the most liquid and active markets in the world. Governments, corporations and individuals around the world buy US debt as a safe place to invest large amounts of capital. US debt may not be risk free, but given the alternatives, it remains a top choice for many investors. Defaulting on US debt is arguably unconstitutional. Article I, Section 8, Clause 2 of the US Constitution states, “The Congress shall have Power to…borrow money on the credit of the United States….” Further, Section 4 of the 14th Amendment reads, “The validity of the public debt of the United States, authorized by law, including debts incurred for payment of pensions and bounties for services in suppressing insurrection or rebellion, shall not be questioned.” Why Japan is not Greece – despite its high debt-to-GDP ratio According to Forbes, among advanced economies, Japan is the debt champion, with a debt/GDP ratio over 180%. Troubled Greece comes in second place with a debt/GDP ratio just under 150%, and Italy holds third place at 109%. By contrast, the US is in eleventh place (out of 34) with debt equal to 61% of GDP. So with this high debt ratio, why is Japan not defaulting as Greece has done? Many reasons, including: The majority of Japanese debt is held by Japan itself. The biggest holders of Japanese Government Bonds (JGBs) are some of Japan’s largest corporations and banks. Even when the underlying fundamentals of the economy don’t make sense, Japan’s companies and individuals continue to buy Japanese bonds – not missing even one year. And even when JGBs were issued at negative rates, demand has persisted. Think about that for a moment. Negative rates mean that buyers not only receive no income, they actually suffer a reduction in principal for borrowing – yet the Japanese have still been willing buyers. Unless this long loyalty streak is broken, it seems that Japan could inflate its way out of its debt problems by using the simple expedient of selling more bonds (printing more money). Greece, on the other hand, does not have the luxury of escaping its debt problems in a similar fashion. The yen is strong. The demand for Japanese currency is akin to the demand for the US dollar in the world. As long as the yen has perceived value to investors, Japan will have the ability to print more yen and inflate its way out of its debt balances. International coalitions are being created to deal with government defaults An article by the nonprofit Project Syndicate highlights the steps now being taken by countries and organizations to: streamline guidelines; create a framework to avoid defaults; and be better equipped to deal with sovereign defaults. In September 2015, the United Nations decided to implement procedures to be used to help restructure debt of troubled nations, effectively creating a system for mitigating massive debt restructuring problems. Though they don’t have the force of international law, these steps were designed with the hope that they would be universally followed. The International Capital Market Association (ICMA), with the support of the IMF and the US Treasury, has suggested changing the language of debt contracts such that restructuring of debt could be approved by a super majority of creditors, thus preventing one or two creditors from stalemating attempts to restructure a country’s sovereign debt. While we may create international rules and put systems in place, the ultimate responsibility for avoiding debt crises lies with individual countries. Countries need to practice fiscal responsibility and international bodies need to respect sovereign immunity, rather than encouraging countries to exchange their sovereignty for short-term gains promised by better financing conditions or other rewards. As stated in a Columbia University article, “A system that actually resolves sovereign-debt crises must be based on principles that maximize the size of the pie and ensure that it is distributed fairly. We now have the international community’s commitment to the principles; we just have to build the system.” Portfolio implications: Some views from the money managers we hire We spoke at length with some of the money managers we hire about their views on the likelihood of widespread sovereign defaults, and generally their views were as follows: Global growth and inflation have moved lower, yet downside risks persist. While the spread between Emerging Market and Develop Market yields have reached 2008 crisis levels, manager consensus is that EM debt is challenging. They advise investors to be cautious and underweight near term but not abandon EM debt over the long term as they believe EM debt still has the thrust for stronger growth, better demographics and generally lower debt loads. SPREAD BETWEEN LOCAL CURRENCY EM & DM SOVEREIGN YIELDS Accommodative monetary policy remains crucial for ongoing global recovery. The managers we hire believe it may be necessary for the ECB to intervene to stop a sovereign debt crisis (as seen on March 10, 2016 when Mario Draghi, President of the European Central Bank, lowered interest rates and expanded the ECB’s bond buying program). Alternatively, the Fed could intervene to stop a financial crisis in order to prevent widespread chaos. ECB support is needed to nudge growth and inflation such that the EU economies don’t slip into recession. The expansionary policy in Japan is also needed to anchor inflation. Based on our conversations with a number of managers, they believe that global banks will need to continue expansionary policies in the coming years. Active management is critical in such an environment, a sentiment GV strongly echoes. The managers acknowledge that risks remain and investors should: maintain portfolios with ample liquidity (bond ETFs may not be as liquid); manage risk exposure; avoid chasing markets for yields; maintain liquidity to react to market dislocations; and stay diversified. The managers we hire emphasize that risk assessment is the key to making investment choices. As one manager explained in 2011: [A] robust approach to the assessment of sovereign risk has become even more essential. It also means that investors must assess risk of one issuer relative to another. Some factors are more important than others – including maturity profile, domestic/foreign ownership balance, issuer credibility and general financial depth. Many of these opportunities are slow-moving in nature; in the short term, liquidity and volatility will continue to provide the early warning signs for investors. In practice, today’s environment requires investors to be more discerning about their investment choices. For example, although EM debt is challenging as a whole, India may be a good buy as it has benefited most from the falling commodity prices. (Note: This is an example and is not intended as an investment recommendation.) We believe that investing with active managers, rather than passive ETFs, gives investors a better chance of making these fine distinctions. Predictions are not reality. In 2010-2012, the European sovereign debt crisis threatened the existence of the Euro and European Union. Then the ECB stepped in. With the crisis averted, countries like Spain and Portugal have started growing again. The Euro still exists, and Greece is still a member of the EU. This shows that concerns of widespread defaults might be exaggerated, even while we acknowledge the existence of downside risks. SUMMARY Some of the active bond managers we hire, including Western Asset, Goldman Sachs, PIMCO and GW&K, are large bond managers actively investing in the heart of the fixed income market. Collectively, they’re monitoring trends, comparing yields and employing risk measures to construct portfolios that avoid excessive risk, limit illiquidity and reduce concentration. There are daunting risks for investors that warrant caution. However, according to history and current data, the risks of massive sovereign defaults may be overstated. In short, it’s not different this time.

### 1AR---AT: Deindustrialization

#### Neolib is sustainable---answers overaccumulation and deindustrialization

--accelerating market-driven brown solves poverty and resources

--consumption will stabilize

--tech solves

Saunders 16 – MA in Environment and Planning, PhD in engineering-economic systems from Stanford University (Harry, “Does Capitalism Require Endless Growth?,” The Breakthrough Institute, http://thebreakthrough.org/index.php/journal/issue-6/does-capitalism-require-endless-growth)

6. There is another path to stable and declining calls on the planet’s endowment of natural capital. Malthus erred not only because he failed to understand the relationship between fertility rates and food consumption but also because he underestimated the rate at which agricultural productivity would improve. By growing more food on every acre of land, human societies avoided mass starvation. More broadly, rising economic productivity due to technological advances raises incomes, creates economic surplus that can be reinvested in new capital and infrastructure, and produces more economic output from less natural capital input. So long as there are large populations living in deep poverty, gains in economic productivity will be put toward greater output, assuring that some or all of the efficiencies associated with productivity gains will be put toward greater production and consumption. But once everyone on the planet achieves a satisfactory level of consumption, consumption of goods and services should stabilize while calls on natural capital should stabilize and then decline.[34](http://thebreakthrough.org/index.php/journal/issue-6/does-capitalism-require-endless-growth#foot34) By satisfactory levels of consumption, what I mean is a standard of living that would be recognizable to the average citizen of an advanced developed economy — modern housing, an ample and diverse diet, sufficient electricity for run-of-the-mill household appliances, roads, hospitals, well-lit public spaces, garbage collection, and so on. The saturation of demand for goods and services in advanced developed economies in the latter half of the twentieth century provides a reasonable proxy for the point at which most people start to see diminishing utility from further household consumption. In a zero-growth world, in which household consumption has saturated while labor- and resource-sparing technological change continues, leisure time grows continually over time while societal calls on natural capital decline.[35](http://thebreakthrough.org/index.php/journal/issue-6/does-capitalism-require-endless-growth#foot35) Given these conditions, how quickly a zero-growth economy is achieved, and calls on natural capital globally peak and then decline, depends upon three closely related phenomena: how rapidly global population stabilizes, how rapidly incomes among the global poor rise, and the rate at which resource-sparing technological change occurs. 7. Getting to a zero-growth steady state economy with declining calls on natural capital will require, then, sustaining — or better yet, accelerating — two trends that capitalism has proven better able to advance than any alternative economic arrangement to date: lifting large agrarian populations out of poverty, and improving resource productivity through technological change. The former, as noted above, is also the key to stabilizing global population.

### 1AR---AT: Social

#### **Capitalism is curbing global poverty now — the alternative entrenches poverty**

Brockman, 13 — [Katie Brockman, cofounder for The Borgen Project, 2013 (“Capitalism Is Helping End Global Poverty,” The Economist, 6-11-13, Available Online at <http://borgenproject.org/capitalism-is-helping-end-global-poverty/>, Accessed on July 8th, 2013)][SP]

1.1 billion people in the world still live in extreme poverty, which means surviving on less than $1.25 per day. While that may seem like bad news, the good news is that that number is half of what it was 20 years ago. Between 1990 and 2010, 1 billion people were lifted out of extreme poverty, and now we need to do it again to wipe out extreme poverty by 2030 to reach the goal set by the World Bank.¶ So, who is to thank for helping curb poverty around the world? Certainly, the leaders who proposed the Millennium Development Goals have contributed by raising awareness about the problem of poverty and encouraging advocacy by creating goals. And without a doubt, the nonprofit organizations that have raised money and volunteered to help raise less than privileged people out of extreme poverty should be applauded. But, the most significant hero in this scenario may be capitalism.¶ One of the best ways to help people is to teach them how to help themselves. Sending food, medical care, and other supplies to help the poor helps greatly, but not as much as helping a country grow so that they can create their own food, become doctors to care for the sick, and buy or make their own supplies. When a country’s entire economy grows, individuals’ financial outlooks begin to look brighter as well.¶ China is a prime example of how capitalism is helping end global poverty. The country has one of the most impressive “rags to riches” stories, bringing 680 million people out of extreme poverty from 1981 to 2010. Furthermore, a staggering 84% of China’s massive population used to live in extreme poverty, and that number has now been reduced to 10%. Most of the reasoning behind this incredible transformation lies in the fact that China’s productivity level drastically increased towards the end of the 20th century, supplying people with jobs to bring them out of extreme poverty.¶ There is much more to global poverty and the methods of ending it than simply providing jobs through capitalism. There are major issues with inequality and government systems, for example, and there’s not always a simple answer. But, growth remains one of the most significant ways to help a nation lift and keep itself out of extreme poverty.

### 1AR---Transition

#### AI doesn’t solve – technologically impossible, replicates squo errors, can’t adapt to changes

Fernández-Villaverde 21 (Jesús Fernández-Villaverde is currently Professor of Economics at the University of Pennsylvania, where he serves as Director of Graduate Studies in the Economics Department, Visiting Professor at University of Oxford, Visiting Fellow at Nuffield College (Oxford), Visiting Scholar at the Federal Reserve Banks of Chicago, New York, and Philadelphia and the Bank of Spain, Advisor to the Hoover Institution at Stanford University’s Regulation and Rule of Law Initiative, and a member of the National Bureau of Economic Research and the Center for Economic Policy Research, July 29th 2021, “Artificial Intelligence Can’t Solve the Knowledge Problem” Public Discourse, <https://www.thepublicdiscourse.com/2021/07/76963/>) MULCH

The increasing sophistication and competence of machine learning in these fields has given public policy analysts misguided confidence in the ability of machine learning-aided economic policy to substitute for human decisions. The truth is, these new methods repeat the errors of previous attempts to automate and centralize economies. Although machine learning demonstrates an impressive capacity to solve complex analytical problems, it only finds associations rather than meaningful causal relationships, and it is unable to overcome fundamental information incentive problems that the free market adequately solves. In other words, in spite of Mr. Ma’s optimism, artificial intelligence will simply never be smart enough to replace the free market.

The truth is, these new methods repeat the errors of previous attempts to automate and centralize economies. The Power of Machine Learning Artificial intelligence and machine learning are powerful tools for recognizing patterns with remarkable accuracy. Imagine, for instance, that we try to predict credit card fraud using dozens of data points from credit card transactions (e.g., the time of day and week when the transaction occurred, the item purchased and its price, the use of the credit card in the previous twenty-four hours, etc.). In this case, ML is helpful, because we don’t need to know which characteristics of transactions are relevant, nor what kind of relationship exists between the datapoints. If we have access to millions of credit card transactions and the knowledge of whether the transactions were fraudulent, we can “train” the model of the relationship, called the “functional form,” to fit past patterns to new data and detect, often with fantastic success, whether a new transaction is fraudulent. At a fundamental level, there is nothing very “intelligent” here: it is an exercise in massive data fitting. What is intelligent is that the process is highly automated and, therefore, easily scalable to multiple environments. There are three main reasons why machine learning is currently in vogue. First, our computers have become much more powerful, capable of performing the data analysis that, for decades, academics had only theorized about. Secondly, thanks to the internet and cheap computing, we now have access to much larger and comprehensive datasets. In economics, for example, a typical empirical paper had a few hundred observations in the 1970s. Today, it is common to see papers with tens of millions of observations. That is why AI and ML are often associated with expressions such as “big data” or “data analytics.” Finally, computer scientists and applied mathematicians have made huge advances in the efficiency of machine learning techniques that, in concert with growing computational power and datasets, have increased the feasibility of data analysis techniques that were previously only theoretical.

In order to harness the power of machine learning, incredibly large datasets are required. The rule of thumb in the industry is that one needs around a million labeled observations to train a network. These enormous datasets have arisen from two primary situations. First, large firms like Netflix and Amazon gather a lot of information from customer activity, allowing them to predict what else you might want to watch or purchase. Secondly, new techniques generate all possible permutations of data observations and identify relationships within these data that we can compare to data we find in the real world.

Public Policy and the Limits of Machine Learning

Unfortunately, in many areas of public policy, we do not have access to such a wealth of data and, most likely, we never will.

Take the example of setting monetary policy, i.e., the regulation of how much money to supply, typically conducted by national central banks, such as the Federal Reserve in the U.S.

Monetary policy is a relatively straightforward topic with fewer moving parts than other kinds of economic policy. Could machine learning ever replace the Federal Market Open Committee (FOMC, the main policy instrument of the Federal Reserve System)? I am skeptical. For one thing, the FOMC usually has a limited amount of data. In the United States, we only have reliable data for output, consumption, and investment after World War II and, even then, only at a quarterly level. If we count them, from 1947:Q1 (the first “good” observation in terms of the accuracy of our measurement) until 2021:Q2 (the last observation as I write this), we have 298 data points. This is far fewer than acceptable for machine learning techniques.

Furthermore, the US economy has radically changed, which limits the relevance of older data. We have moved from an economy dominated by manufacturing into an economy driven by services, and financial innovations have transformed the relationship between financial and real variables. The evolving structure of the economy shifts the relationships between the data points, making it harder for machine learning to find clear patterns. These structural changes mean that econometricians often do not use observations before the early 1980s when they estimate the effects of monetary policy on output. In fact, such estimates change sharply depending on whether we include early observations. Moreover, the economy is bound to continue to change, meaning we will continue to have to deal with newer and newer data.

Employing individual data (such as consumption data of households or financial transactions) can help us get more observations, but we will still encounter similar problems. Ponder, for example: how informative are the consumption patterns of married couples in the 1990s, in their early 40s, with several kids at home, about the consumption patterns of single individuals in the 2020s, also in their early 40s, without kids? Moreover, there are severe limitations on what individual data can teach us in the absence of detailed explanations about the nature of relationships between different data points.

This additional problem with using microdata is an instance of the Lucas critique, named after Robert Lucas, one of the most influential economists of the last century. The essence of the critique is that it is difficult, if not impossible, to distinguish in data how much behavior is attributable to unobserved characteristics or to the impact of particular public policies.

Machine learning faces the same problem that economists have faced for a century: distinguishing causation and correlation. Moreover, the answer that machine learning provides is valid only under a constant set of circumstances: changes in policy may affect different individuals differently, which gives misleading results about the impact of a policy.

If an airline tightens its rules for upgrades in a way that implicitly favors business-class travelers with few but expensive trips, this type of traveler will react differently to the change than business class travelers who make more regular, shorter trips. Machine learning, which operates without a theory of the decision-making that underlies external behavior, will only identify associations between rule changes and purchase activity, rather than true customer preferences. Moreover, experimentation with different policies to observe greater variation in behavior is often infeasible or even immoral. An airline cannot sporadically alter its upgrade rules unless it wants to alienate its customers, just as we cannot perform experiments with national monetary policy without risking wild economic fluctuations.

Secondly, experimenting on a sample will only allow machine learning to give an explanation for individuals in that sample. For example, administering a lottery for applicants to charter schools will only be able to tell us about the impact of charter schools on those who have applied, and not about the general population, many of whom did not apply. Furthermore, firms nevertheless often enjoy greater scope for experimentation than national governments; imperfect even for many firms, machine learning is all but unavailable to national governments.

The free market is not perfect, and its outcomes are often unsatisfactory. Nevertheless, like democracy, all the other alternatives, including “digital socialism,” are worse.