# 1AC

### Adv 1 is Unification

#### Dual enforcement authority between the DoJ and FTC creates havoc among antitrust rulings now—it ensures conflicting regulations and dissent which produces confusion and inefficiencies

Cox, 20

(Alyson M. Cox, JD from Notre Dame Law School, managing articles editor at Notre Dame Law School, “From Humphrey’s Executor to Seila Law: Ending Dual Federal Antitrust Authority,” 96 Notre Dame L. Rev. 395 (2020) NL)

In the summer of 2019, the Department of Justice and Federal Trade Commission announced that they would be dividing the investigations into four of the biggest American tech firms, with the DOJ investigating Google and Apple and the FTC investigating Amazon and Facebook. Senator Mike Lee was among the decision's many critics; he argued that the "splitting of this tech antitrust review across two federal agencies, despite the many similar competition issues that will be investigated, illustrates the absurdity of having two federal agencies handling civil antitrust enforcement."1 But even this "brokered peace didn't last long," 2 and it soon became clear that the DOJ and FTC would be conducting overlapping investigations.3 The DOJ and FTC have shared civil antitrust enforcement since the early 1900s,4 and although their authority is not identical, "the core of the agencies' jurisdiction is congruent." 5 This dual enforcement structure has been continuously challenged for the better half of the last century by both academics and government actors,6 although conventional wisdom holds that elimination of either agency's civil antitrust authority would be politically costly.7 There are well-recognized efficiency costs to the dual enforcement structure, including the expensive and time-consuming merger-clearance process. 8 The two agencies often compete in "turf wars" over cases,9 and have even filed amicus briefs against each other in federal court,10 raising serious questions of government efficiency and procedural and substantive fairness. But in addition to the well-worn complaints about efficiency and fairness, there are significant, mounting reasons to subject this dual enforce-ment authority to constitutional evaluation, especially in light of recent doctrinal shifts regarding the constitutionality of independent agencies. Last term, the Supreme Court held in Seila Law that the independence of the Consumer Financial Protection Bureau (CFPB) was an unconstitutional violation of the separation of powers, shrinking Humphrey's Executor down to a very thin, very wobbly protection of the FTC's constitutionality. Aggrieved parties are already challenging FTC actions on a range of constitutional grounds,11 and the majority opinion in Seila Law provides a roadmap for doing so. This Note catalogues and proposes solutions to both the traditional concerns of efficiency and fairness and the modern constitutional problems posed by the current dual enforcement structure. Part I will compare the two antitrust agencies on the basis of their structures, accountability, statutory authority, and enforcement procedures, as well as evaluate potential concerns with vesting either agency with the sole authority to enforce civil antitrust laws. Part II will evaluate the perils of the current dual enforcement structure, exploring both the traditional arguments about efficiency and fairness and the modern constitutional challenges. Part III will evaluate potential legislative solutions to the problem of dual antitrust enforcement authority in the United States. The constitutionality of the FTC's status as an independent agency is again under serious question; it is time for Congress to seriously rethink and restructure civil antitrust authority accordingly.

#### Specifically, merger clearance delays and different procedural and substantive standards ensure regulatory uncertainty

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1. Merger Clearance Delays The HSR Act only allots thirty days post-notification for merger review, but the DOJ and FTC often take much of, or more than, the thirty days just to decide which agency is going to investigate a merger. 122 The Antitrust Modernization Commission (AMC), which studied the problem of dual enforcement in the mid-2000s, argued that this inefficiency places "significant burdens on companies with time-sensitive transactions." 12 3 When the agencies fail to come to a timely resolution, they frequently initiate second requests that are expensive for parties to comply with. 124 This is because, prior to clearance, staffers "cannot reach out either to the merging companies or third parties," and they frequently need more time than what is left over of the thirty days to complete their review. 125 Unlike disputes between other executive agencies, there is no way to quickly resolve these disputes through the chain of command because the FTC is not accountable to the President. Assistant Attorney General Makan Delrahim has stated that one standstill was solved with a coin toss. 126 Axon Enterprises called the clearance process an "uncodified black box" that can have "real consequences" for parties. 127 Such turf wars are a waste of taxpay ers' resources and frequently shift considerable burdens to parties under investigation. 2. Different Procedural Standards Companies often feel that they are treated differently depending on whether their case is assigned to the DOJ or the FTC. 128 These perceptions primarily stem from the fact that the DOJ and FTC pursue different injunctive relief in federal court.1 2 9 In the case of anticompetitive mergers, the DOJ pursues preliminary and permanent injunctions, which give parties finality.130 The FTC, however, pursues only preliminary injunctions; regardless of the outcome of the injunction, the FTC then proceeds through a lengthy administrative process for permanent relief.131 The AMC noted that the "FTC's ability to continue a merger case in administrative litigation ... may lead companies whose transactions are investigated by the FTC to feel greater pressure to settle a matter than if they had been investigated by the DOJ."132 As a result, the agencies' procedural differences "can undermine the public's confidence" in antitrust authorities. 133 3. Different Substantive Standards A third commonly made argument about the undesirability of the dual enforcement structure is the uncertainty and cost to businesses seeking to comply with both the DOJ and FTC when they apply different substantive standards. 134 The two agencies frequently disagree on legal standards, as evidenced by the amicus brief filed by the DOJ against the FTC in the Qualcomm litigation, 135 as well as broader antitrust policy. 136 Is it fair to companies that there is not always a unified, knowable antitrust position of the United States? The problem of differential substantive standards in dual enforcement looms large in the current debates about antitrust enforcement and big tech, especially in the current cases of Facebook, Google, Amazon, and Apple.1 3 7 These overlapping investigations raise the possibility that the DOJ and FTC might not only present different litigating positions of the United States on certain topics, but the agencies might actually enforce different substantive standards on shared plaintiffs. When both the FTC and the DOJ, in addition to states and congressional committees, are inquiring into internet platforms, companies "'trying to make decisions with some level of comfort and certainty' are finding out that there is little of either." 138 The Qualcomm litigation is further evidence of the undesirability of competing antitrust policy visions. This litigation arose out of the fundamental disagreements between the FTC and DOJ on the relationship between antitrust and intellectual property law. Qualcomm sells chips used in modern cellphones to manufacturers and licenses patents which are essential to certain cellphone technology standards. 139 The FTC sued Qualcomm, arguing that because the company's chips were the standard for cellphones, the company had a duty to makes its chips available for licensing.140 The DOJ disagreed, arguing in its amicus brief against the FTC that Qualcomm's refusal to license was justified by its patents. 141 This conflict, if the FTC were not independent, would normally have been resolved through the Executive Branch's interagency dispute resolution process. Instead, the conflict had to be litigated, at the expense of the party trying to compete in the international market and comply with American antitrust law.

#### That uncertainty ruins tech companies—tanks investment and R&D necessary for effective innovation

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Thus, dual enforcement has greater risks than ever before, both because disagreement is more likely and costs of uncertainty are greater. This subpart outlines this potential for uncertainty in a variety of areas of antitrust doctrine. In fact, the risk is not just potential. The DOJ and FTC already disagree on the important issue of how to regulate SEPs, creating uncertainty in a growing industry worth billions of dollars.46 The agencies are additionally fighting over who should take the lead in regulating high tech, resulting in divergent investigations when antitrust analysis requires consideration of the entire competitive market to reach sound conclusions. 47 1. The Need for Certainty in Antitrust Regulation of Technology

A unified approach to antitrust regulation is especially important when it comes to the technology industry for three reasons. First, the rapidly growing technology industry is at the center of the U.S. economy: in 2018, the internet sector accounted for $2.1 trillion of the economy and 10 percent of the GDP. 48 Uncertainty about antitrust rules created by dual enforcement hinders economic growth.

Second, technological industries are especially sensitive to shifts in antitrust policy because antitrust actions can change the trajectory of fast-changing industries. For instance, the DOd's antitrust enforcement action against the Bell System broke up the monopoly in telephony. 49 One court later summarized the effect as "an unprecedented flowering of innovation" in the telecom industry.50 Agency antitrust action also played a large role in the growth of software, browser, and web company competition. 5 1 In anticipation of a Justice Department antitrust suit, 52 IBM unbundled its software and hardware products in the 1960s,53 dramatically changing the software market. Nearly overnight, software went from a typically free good to a commercial product.54 Governmental antitrust enforcement is additionally credited for Microsoft's 1997 investment in its rival company Apple, which saved the then-nascent company from the brink of bankruptcy. 55 Microsoft likely acted in self-preservation because it faced antitrust scrutiny that came to a head in a DOJ suit the year after.56 The Microsoft settlement itself is "credited with giving web companies like Google-and browsers like Google Chrome . . . space to grow." 57 These actions changed the technological landscape, and future antitrust decisions regarding technology companies will have just as significant of an impact, if not more.

Moreover, antitrust policy is very important to the research and development that is the heart of innovation in tech, particularly as more research and development has moved from the public sector to the private sector.58 Private companies are affected more directly by antitrust policies. 59 Even the financing of technology is dependent on antitrust law. Today, as discussed in more detail below,60 the primary reason a tech start-up receives funding from investors is its acquisition potential; merger and acquisition policies play a significant role.61 Once again, certainty here is important for investors, and possible and actual conflicts between DOJ and the FTC reduce certainty.

Third, a unified approach to antitrust has become more important because the antitrust issues affecting tech are particularly complex; it is difficult to determine how best to apply antitrust law to emerging technologies. 62 This challenge makes it more likely that DOJ and the FTC will proceed on different theories, increasing uncertainty. For instance, antitrust scholars and regulators have struggled to apply the traditional small but significant non-transitory increase in prices (SSNIP) test to zero-price tech markets.6 3 The SSNIP test, used by both the FTC and DOJ, defines a relevant antitrust market as the "smallest grouping of products for which a hypothetical monopolist could profitably impose a 5% price increase." 64 However, many technology platforms offer their products at no monetary cost to customers. The lack of measurable price renders the SSNIP test difficult to operationalize. 65 This complexity makes it more likely that the DOJ and the FTC will apply the test differently, resulting in uneven and unfair outcomes. SSNIP is only one of many areas of debate regarding how antitrust is to be applied to technology. Technology has raised questions regarding whether increased prices or decreased output is still a viable measure of monopoly. As an example, Facebook has not raised prices or restricted output since its founding, despite plausible claims that it dominates social media.66 While dominant platform companies like Amazon have been accused of levying monopoly power,67 others claim that platform giants and their house brands actually keep prices low. 68

Even defining the market of technology companies raises novel conundrums. To illustrate, Google has a very large share in the market for horizontal search (searches across the internet), but not in general search: users often turn to specialized websites, such as eBay or Amazon, for product searches. 69 Even if horizontal search is the defining market, Google's large share does not necessarily beget monopoly power. Consumers can easily switch between search engines and spend most of their time on websites, which compete with search engines for advertising revenue.70 Addressing these complex issues requires careful coordination between the DOJ and FTC, which based on the agencies' histories, is difficult at best and unachievable at worst.

#### Successful tech innovation combats existential climate change and runaway environmental devastation

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The fourth industrial revolution, also labelled Industry 4.0, was beget with emergent and disruptive intelligence and information technologies. These new technologies are enabling ever-higher levels of production efficiencies. They also have the potential to dramatically influence social and environmental sustainable development. Organizations need to consider Industry 4.0 technologies contribution to sustainability. Sufficient guidance, in this respect, is lacking in the scholarly or practitioner literature. In this study, we further examine Industry 4.0 technologies in terms of application and sustainability implications. We introduce a measures framework for sustainability based on the United Nations Sustainable Development Goals; incorporating various economic, environmental and social attributes. We also develop a hybrid multi-situation decision method integrating hesitant fuzzy set, cumulative prospect theory and VIKOR. This method can effectively evaluate Industry 4.0 technologies based on their sustainable performance and application. We apply the method using secondary case information from a report of the World Economic Forum. The results show that mobile technology has the greatest impact on sustainability in all industries, and nanotechnology, mobile technology, simulation and drones have the highest impact on sustainability in the automotive, electronics, food and beverage, and textile, apparel and footwear industries, respectively. Our recommendation is to take advantage of Industry 4.0 technology adoption to improve sustainability impact but each technology needs to be carefully evaluated as specific technology will variably influence industry and sustainability dimensions. Investment in such technologies should consider appropriate priority investment and championing. 1. Introduction Industry 4.0 is transforming manufacturing firm business models. These technologies can support production flexibility, efficiency, and productivity through various emergent communication, information and intelligence technologies (Ibarra et al., 2018; Rüßmann et al., 2015). Industry 4.0 technologies include, but are not limited to, additive manufacturing, artificial intelligence, big data and analytics, blockchain, cloud, industrial internet of things, and simulation (Dalenogare et al., 2018; Bai et al., 2017). These Industry 4.0 technologies can potentially provide tremendous innovation and competitiveness growth; they may also improve current industrial system sustainability (Müller et al., 2018; Stock and Seliger, 2016). Industry 4.0 technologies adoption in companies and industries has taken on greater importance and visibility (Luthra and Mangla, 2018; de Sousa Jabbour et al., 2018; Kiel et al., 2017). Yet these technologies implications on society’s sustainability objectives require more attention and evaluation (Bai and Sarkis, 2020). Traditional production systems are notorious in their poor ecological imbalances. The litany of higher resources consumption, global warming, general environmental degradation, and higher environmental pollution are traceable to traditional manufacturing systems and technologies (Tseng et al., 2018). We also face various social problems and challenges, including poverty, inequality, prosperity, and peace and justice concerns (Griggs et al., 2013). Legitimacy theory argues that meeting key stakeholder sustainability requirements – such as carbon emissions reductions – contributes to superior performance (Lanis and Richardson, 2012). The fourth Industrial revolution can potentially address many of the ecological and social limitations of traditional industrial practices and technologies; to provide a more sustainable future (Morrar et al., 2017). Ultimately, these actions may translate into long-term organizational competitiveness. According to McKinsey’s survey of 130 firm representatives from various industries in China, Chinese manufacturing firms have great enthusiasm and expectation for Industry 4.0, but only 57% of Chinese enterprises are fully prepared for Industry 4.0 technologies. This global study showed that it is far lower than the United States (71%) and Germany (68%) (mckinsey.com, 2016). A major reason is many manufacturing firms may not understand the value of these technologies. Industry 4.0 technologies are complex and integrated architecture manufacturing-information technology integration (Frank et al., 2019). Evaluating the impact of these technologies based on standard evaluation may be difficult; but additional evaluation for sustainability benefits can increase their strategic adoption, but makes the process even more complex. Thus, it is still an important and open subject of research in Industry 4.0 evaluation (Dalenogare et al., 2018). Overall, effective and robust evaluation methods and decision support tools can help manufacturing firms effectively implement and understand those Industry 4.0 technologies; especially considering broader economic implications. These broader implications, in addition to environmental and social concerns, include building competitiveness of firms and their nations. This study argues that the principles and aims of Industry 4.0 technologies are not limited to conventional organizational business and economic performance, but will contribute to a more sustainable society. Further understanding of Industry 4.0 technologies and philosophical relationships to sustainability of society is important for practitioners; especially when capital investment decisions are to be made (Bai and Sarkis, 2013, 2017). Policymakers, seeking to make policies on Industry 4.0, could also benefit from further elicitation of this relationship (Lin et al., 2017). Yet, building and understanding the relationships between Industry 4.0 technologies and sustainability is not trivial. There is also significant lack of knowledge and uncertainty in this relationship between sustainability and Industry 4.0 technologies (Kamble et al., 2018a). This research seeks to answer three questions that address this knowledge gap and uncertainty: Q1: What value can these Industry 4.0 technologies create for economic, environmental and social sustainability, and how can they help to achieve SDGs? Q2: What are the differences in the value created by these Industry 4.0 technologies in different industries? Q3: How can the value of these Industry 4.0 technologies be effectively evaluated? This study identifies key challenges of Industry 4.0 technologies to contribute to sustainable society enhancement. This research makes three major contributions. First, we further refine Industry 4.0 technologies understanding in terms of society’s sustainability. The application scope of these technologies is evaluated using a measurement framework based on a triple-bottom-line conceptualization (Elkington, 1998). Second, a novel multi-contextual decision-making method is introduced. This methodology integrates hesitant fuzzy set (HFS), cumulative prospect theory (CPT) and VlseKriterijumska Optimizacija I Kompromisno Resenje (VIKOR) to evaluate Industry 4.0 technologies based on their application scope. Third, the method and sustainability attributes are applied to an empirical case, using secondary published data. The methodology provides insight to managers and researchers to comprehensively evaluate Industry 4.0 technologies for adoption. The secondary data derives from the World Economic Forum White Paper “Driving the Sustainability of Production Systems with Fourth Industrial Revolution Innovation” (World Economic Forum, 2018). The overall results show that the framework, methodology, and case application can prove valuable to both practitioners and researchers. It also sets the foundation for further application and research on the relationship between Industry 4.0 and sustainability. Industry 4.0 technologies practically exhibit significant uncertainty and varying performance results across different applications or contexts. HFS can retain possible performance across multiple applications or varying opinions of all decision makers. However, the fuzzy set – alone as a basic technique – can only summarize these opinions and possible performance into a fuzzy value, and not effectively integrating diversity of the different applications and voices. This conversion of multiple opinions into a fuzzy value will result in information loss and may not accurately reflect performance within each context. Hence, HFS is an effective approach to represent and address uncertainty originating from diverse contexts and multiple decision maker involvement (Torra and Narukawa, 2009). It extends fuzzy sets and can represent the spectrum of Industry 4.0 technology possibilities across these diverse contexts. In our empirical evaluation we have completed a performance evaluation of each technology across different applications. The remainder of this paper has the following organization. Section 2 provides literature background on Industry 4.0 technologies and sustainability to help set the foundation for this research and exemplify its contribution. In section 3, the HFS, CPT and VIKOR concepts are introduced. A multi-contextual decision-making model is advanced in section 4. A comparative analysis in section 5 verifies the feasibility and capabilities of the proposed method and allows us to discuss the initial findings in light of previous Industry 4.0 research. Finally, section 6 includes conclusions, contributions, limitations and future research directions. 2. Background and literature 2.1. Industry 4.0 technologies Industry 4.0 is purported to be a new paradigm of smart and autonomous manufacturing. It more profoundly integrates manufacturing operations systems with communication, information and intelligence technologies (Wang et al., 2017; Jeschke et al., 2017). Among the litany of benefits, Industry 4.0 can provide manufacturing firms with profitable business models, higher efficiency, quality, and improved workplace conditions (Hofmann and Rüsch, 2017). It has gained considerable attention among researchers and practitioners given these potential benefits (Liao et al., 2017). But disadvantages including lack of understanding, costs, legacy system alterations, and potential energy disadvantages have made the decision for adoption and evaluation difficult (e.g. Saberi et al., 2019, which discusses barriers to blockchain technology as an example). Industry 4.0 technologies may be grouped into physical and digital technologies. Physical technologies mainly refer to manufacturing technologies such as additive manufacturing (Gibson et al., 2014), or sensors and drones (Morrar et al., 2017). Digital technologies mainly refer to modern information and communication technologies, such as cloud computing, blockchain, big data analytics, and simulation (Liao et al., 2017). Table 1 summarizes various Industry 4.0 technologies (Dalenogare et al., 2018; Lu, 2017; Wan et al., 2015; Posada et al., 2015). These Industry 4.0 technologies are relatively novel in developing countries, and in small and medium firms. Broader acceptance requires further in-depth understanding and developments especially for underrepresented populations; including Industry 4.0 impact on sustainability (Müller et al., 2018). 2.2. Industry 4.0 technologies and sustainability Industry 4.0 and sustainability1 are relatively recent emerging technological and organizational trends that are influenced by or influence improving productivity and sustainable production (Luthra and Mangla, 2018). Industry 4.0 technologies seek to overcome contemporary challenges – global competition, volatile markets and demand, increased customization through communication, information and intelligence, and decreasing innovation and product life cycles (Kiel et al., 2017). Industry 4.0 technologies potentials include substantial contributions or limitations to organizational and social sustainable development (Stock and Seliger, 2016). Considering the economic dimension, reduced set-up times, shorter lead times, reduced labor and material costs, increased production flexibility, higher productivity and enhanced customization exist (Dalenogare et al., 2018; Witkowski, 2017; Rüßmann et al., 2015). From the ecological point of view, Industry 4.0 technologies can reduce energy and resource consumption through detection and data analysis across production and supply chain processes (Shrouf et al., 2014). They can lead to reduction in waste or CO2-emissions through data-centered and traceable carbon footprint analyses (Gabriel and Pessl, 2016; Sarkis and Zhu, 2018). Products can be disassembled into their component elements for reuse, recycling, or remanufacturing. For social sustainability dimensions, smart and autonomous production systems can support employee health and safety, by taking over monotonous and repetitive tasks; resulting in higher employee satisfaction and motivation (Müller et al., 2018). However, Industry 4.0 technologies also bring many challenges and limitations to society. For example, reduced employment, information security issues, data complexity, electronic wastes, and poor quality can prevail (Rojko, 2017). Few studies provide insight into the interface between Industry 4.0 technologies and sustainability. Some of them have focused conceptually on specific sustainability related industrial concerns such as the circular economy (de Sousa Jabbour et al., 2018; Tseng et al., 2018). For a systematic review of these studies, see Beltrami and Orzes, 2019. Proponents of legitimacy theory have suggested that firms are incorporating sustainability to meet the concerns and demands of stakeholders (Park et al., 2010). As a result, manufacturing firms need to go beyond pure profit maximization, and address broader societal expectations; increasing social and environmental responsibility. Transforming industrial production through industry 4.0 to meet these sustainability needs has become a legitimacy goal (Kamble et al., 2018b). Although imperfect (Spaiser et al., 2017), the United Nations Sustainable Development Goals (SDGs) provide a common framework and set of goals for firms, industries and countries to achieve sustainable development (Robert et al., 2005). Industry 4.0 technologies have potential to benefit all 17 SDGs. Potential relationships between SDGs and Industry 4.0 technologies appear in Table 2. SDGs may be generally assigned, given there may be some overlap, to TBL dimensions. Ending poverty, providing decent work and economic growth, industry, innovation and infrastructure and reduced inequalities, partnerships for the goals are well aligned with economic sustainability attributes. Ending hunger, good health and well-being, quality education, gender equality, peace, justice and strong institutions are well aligned with social sustainability attributes. Clean water and sanitation, affordable and clean energy, sustainable cities and communities, responsible consumption and production, climate action, life below water and life on land are well aligned with environmental impact attributes. TBL, for organizational decisions, can be utilized to unfold benefits (Bai and Sarkis, 2019). This framework grounds our study for understanding Industry 4.0 technologies relationships to society’s sustainability. For example, lower emission level – climate action goal – technologies support manufacturing firm urban development efforts; and zero sewage discharge – life below water goal – technologies can aid manufacturing firms from polluting freshwater lakes. 2.3. Corporate industry 4.0 technologies evaluation and appraisal Evaluation methods can aid organizations to further understand and adopt Industry 4.0 technologies. They can support managerial decision making. Initial efforts have utilized various tools in disparate Industry 4.0 evaluation and appraisal approaches. The analytical hierarchy process (AHP) has been used to evaluate challenges to Industry 4.0 initiatives for supply chain sustainability in emerging economies (Luthra and Mangla, 2018). AHP-VIKOR methodologies were utilized to support Industry 4.0 application strategies evaluation (Erdogan et al., 2018). But, overall, the literature, thus far, has been quiet on the evaluation of Industry 4.0 technologies on sustainable performance and integrating them with by multiple attribute decision making (MADM) methods. Many MADM methods for technology evaluation exist (for example see Bai et al., 2017); but they are difficult to apply for the evaluation of Industry 4.0 technologies. First, Industry 4.0 technologies are relatively new and there is a lack of knowledge about the real impact and contribution of the Industry 4.0 technologies in general. Second, Industry 4.0 technologies need to be integrated with traditional production systems, making the fitness and compatibility issues even more important. Third, the Industry 4.0 technologies performance is associated with high uncertainties because they are applied in different contexts and industries. There is still considerable uncertainty and confusion since applications may result in contradictory performance on Industry 4.0 applications; especially in trying to balance sustainability contributions. For example, greater digitization may improve equality and economic business factors, but require additional energy requirements resulting in resource depletion or environmentally damaging emissions. These challenges in the evaluation of Industry 4.0 technologies contribute to lack of clarity in sustainability contribution from Industry 4.0 implementation. Specifically, the current academic journal published research does not provide a comprehensive decision support tool with regard to the assessment and analysis of the complex Industry 4.0 and sustainability relationships. This paper introduces a hybrid multi-context decision method that incorporates hesitant fuzzy sets, cumulative prospect theory, and VIKOR to evaluate the Industry 4.0 technologies resulting in a ranking of sustainability attributes. HFSs have been used to handle imprecise data and vague linguistic expressions of decision makers (Xu and Xia, 2011). We use HFSs to represent the uncertainty and diverse performance of Industry 4.0 technologies across different applications. CPT considers decision maker psychological characteristics under risk and uncertain environments; it also evaluates the probability of meeting sustainability performance. Most CPT related methods assume that the reference points are exogenously fixed, but it might not be true in Industry 4.0 decisions; there are shared reference points. Decision makers may update their perceptions and adjust their reference points in response to changes in different decision-making situations (Munro and Sugden, 2003). We integrate this characteristic with CPT; a new perspective not previously applied in CPT related studies. This study considers every technology as an endogenous reference point to characterize decision maker behaviors under risk or uncertainty. We also convert it into possible reference points – each Industry 4.0 technology – based on the prevalence of each technology in a decision context. In decision-making, there is a tendency to apply too much weight to low probability outcomes and too little weight to high probability outcomes (Bai and Sarkis, 2017). CPT can help alleviate this issue. Third, the VIKOR method evaluates the degree Industry 4.0 technologies relate to sustainability attributes. The valuation is based on a value between 0 and 1 [0, 1] that better represents the degree of the technology and sustainability linkage (Bai and Sarkis, 2019). Given the various limitations in methodologies and unique Industry 4.0 and sustainability relationship, we integrate HFS, CPT, and VIKOR in a multistage methodology. We now introduce some general foundation for each technique. 3. HFS, CPT and VIKOR definitions and functions In this section, we present general definitions, notation, and functions of HFS, CPT, and VIKOR. Throughout this paper, X ¼ fx1; x2;…; xng is used to denote the reference set. 3.1. Hesitant fuzzy set (HFS) HFS (Torra and Narukawa, 2009) – an extension of fuzzy sets – is used to represent and address uncertainty originating from decision maker hesitancy (doubt) in providing their alternative preferences in decision making. In our study, it represents uncertainty and performance of Industry 4.0 technologies in diverse contexts; further delineation of these contexts appears in the case application. Definition 1. A hesitant fuzzy set A on X is defined in terms of a function hAðxÞ, when applied to X returns a finite subset of values in [0, 1], AΌf<x; hAπxή>jx 2 Xg: (1) where hAðxÞ ¼ fγjγ 2 hAðxÞg, is called a hesitant fuzzy element (HFE), and represents the possible membership degrees of the element x 2 X to A. Definition 2. Let hAðxÞ and hBðxÞbe two HFEs, the number of values in HFEs hAðxÞ and hBðxÞ are defined as lðhAðxÞÞ and lðhBðxÞÞ. The number of values in different HFEs may be different. In order to be computable, we make the following assumptions (Wei, 2012). First, all the elements are arranged in decreasing order in each HFE hAðxÞ. Hence, hðoÞ A is referred to as the oth smallest value in HFE hAðxÞ. Second, for two HFEs hAðxÞ and hBðxÞ, lðhAðxÞÞ 6¼ lðhBðxÞÞ, then let l ¼ max {lðhAðxÞÞ;lðhBðxÞÞ}. Two HFEs hAðxÞ and hBðxÞcalculated from each other must be of the same length l. Hence, the smaller set is extended until it has the same number of elements as the longer set. For optimistic situations, if lðhAðxÞÞ < lðhBðxÞÞ, then hAðxÞ should repeat the maximum valued set element until it has the same length as hBðxÞ. Alternatively, for a pessimistic situation, hAðxÞ should repeat its minimum valued element until it has the same set length as hBðxÞ. Definition 3. The score function of a HFE hAðxÞis defined in (2) (Xu and Xia, 2011): sπhAπxήήΌ 1 lπhAπxήή X γ2hAπxήγ (2) Definition 4. The distance function between hAðxÞ and hBðxÞ is defined by (3): dπhAπxή; hBπxήήΌ1l Xl oΌ1 􀀀�� hπoή A πxή 􀀀 hπoή B πxή�� ! (3) 3.2. Cumulative prospect theory CPT, utilizing behavioral decision theory (Tversky and Kahneman, 1992), is a descriptive paradigm for human decision behavior under uncertainty or risk. It has been widely used to solve various decision-making problems using bounded rationality theory and subjective decision maker preferences (Bai and Sarkis, 2017). In cumulative prospect theory, the prospect value of the object is determined using a value function ϕπxiÞ. This function represents the subjective value of outcome xi and the weighting function πi of a cumulative probability p, calculated by expression (4). ϕ x; p! ¼ Xk iΌ1 ϕ xi!ππpiήώ ώ Xn iΌkώ1 ϕ xi!ππpiή􀀀 (4) The value function ϕπxiÞrepresents the risk preference and is determined by expression (5). ϕπxiήΌf πxi 􀀀 x0Þα; xi � x0 􀀀 λπ 􀀀 πxi 􀀀 x0ÞÞβ; x0 < xi (5) where xi is the subjective value of an outcome and x0 is a reference point of an outcome; ðxi 􀀀 x0Þα represents gains and􀀀 λπ 􀀀 πxi 􀀀 x0ÞÞβ represents the losses. 0 < α < 1 and 0 < β < 1 are parameters related to the exponential parameters for gains and losses, respectively. If the parameter λ > 1, then it is a loss aversion parameter; decision makers are more sensitive to losses than gains. In this study, we adopt the values of α Ό β Ό 0.88, λ Ό 2.25, which are determined by Tversky and Kahneman (1992) as reasonable initial values. The weighting function ππpiÞþ is the potential cumulative gain by expression (6), and the weighting function ππpiÞ􀀀 is the potential cumulative loss by expression (7). The cumulative probability weight function decision weights are determined by expressions (6) and (7). These functions increase the influence of rare events and shrink the influence of “average” events. πþiðpiÞ¼wþðpi þ⋯þpnÞ 􀀀 wþðpiþ1 þ⋯þpnÞ (6) π􀀀i ðpiÞ¼w􀀀 ðp1 þ⋯þpiÞ 􀀀 w􀀀 ðp1 þ⋯þpi􀀀 1Þ (7) where wþðpiÞ and w􀀀 ðpiÞ denote the weighting functions (subjective probability) for gains and losses, respectively, and defined by (8) and (9). wþðpiÞ ¼ expð 􀀀 γð 􀀀 lnðpiÞϕÞÞ (8) w􀀀 ðpiÞ ¼ expð 􀀀 ðδð 􀀀 lnðpiÞϕÞÞ (9) where pi is the objective probability, γ and δ are model parameters. wþðpiÞ and w􀀀 ðpiÞ are monotonic and exhibit inverse S-shapes for 0<γ, δ < 1. Similarly, γ ¼ δ ¼ 0.8, and ϕ ¼ 1 are determined through experiments as most realistic (Prelec, 2000). 3.3. The VIKOR method The VlseKriterijumska Optimizacija I Kompromisno Resenje (VIKOR), is a MADM method for ranking and selecting alternatives (Opricovic and Tzeng, 2004). It has some advantages over other MADM methods; it can integrate conflicting criteria, provides a simple calculation process, easily scalable, and generates compromise solutions based on proximity to an ideal solution (Awasthi and Kannan, 2016). The multi-criteria measure for compromise ranking is developed with the following Lp-metric: Lp;i ¼(Xm j¼1 hwj��� �f þ j 􀀀 fij��� �.����f þ j 􀀀 f 􀀀 j ��� �ip)1=p; 1�p�∞; i¼1;…; n (10) where fþj is the best performance value for the jth attribute among all objects. Likewise, f􀀀 j is the worst performance value for the jth attribute. fij is the performance value for an objectxi with respect to the jth attribute. Within the VIKOR method p ¼ 1 (as Si) and p ¼ ∞ (as Qi) are used to formulate the ranking measure. Si ¼Lp¼1;i ¼ Xm j¼1 hwj��� �f þ j 􀀀 fij��� �.��� �f þ j 􀀀 f 􀀀 j ��� �i (11) Qi ¼Lp¼∞;i ¼maxjhwj��� �f þ j 􀀀 fij��� �.����f þ j 􀀀 f 􀀀 j ��� �i (12) VIKOR ranks the alternatives by sorting the values of Ri (see expression (13)), for i ¼ 1, 2, …, n, in increasing order. Ri ¼vðS􀀀 􀀀 SiÞ=ðS􀀀 􀀀 SþÞ þ ð1 􀀀 vÞðQ􀀀 􀀀 QiÞ=ðQ􀀀 􀀀 QþÞ (13) where Sþ ¼ min i Si, S􀀀 ¼ max i Si, Qþ ¼ min i Qi, Q􀀀 ¼ max i Qi and v is the weight on the strategy with maximum group utility and 1-v is the weight of the individual regret. 4. Case study application In this section, we develop a multi-contextual – including industry, SDG category, sustainability dimension, and technology type – method that integrates hesitant fuzzy set, cumulative prospect theory, and VIKOR for evaluating the degree of Industry 4.0 technologies. We utilize secondary data from a World Economic Forum White Paper (World Economic Forum (WEF)Accenture, 2018) to provide foundational insight on how Industry 4.0 technologies relate to sustainability. 4.1. Case background As Industry 4.0 diffuses, many regions in the world have sought to develop Industry 4.0 technologies. A World Economic Forum (WEF) project and white paper (World Economic Forum - Accenture, 2018) asked the question: “What changes will the Fourth Industrial Revolution bring to systems of production, and how will they affect sustainability?” The WEF project utilized community outreach meetings in Berlin, Germany, Dalian, China and New York to help address its question. Automotive, electronics, food and beverage, and textiles, apparel and footwear were identified as key influenced industries. Together the industries represented low and high-tech product manufacturing industries with high environmental implication relationships, end-consumer visibility and good potential for further transformation. Europe (Poland), Africa (Kenya, Ethiopia), Asia Pacific (India, Thailand, Vietnam) and Latin America (Argentina, Mexico) were examined to keep the analysis specific yet globally representative and contextual. Forty disruptive applications were identified across four industries to accelerate sustainable production practice. This evaluation framework utilized United Nation SDGs and indicators. Fourteen of the 17 SDGs were selected; these SDGs were grouped into the three areas for evaluating sustainability (economic, social and environmental). The 40 disruptive applications are based on desk research and interviews, noting upside potential and downside risks. This WEF White Paper is the fruit of an intense collaboration between 70 stakeholders from four sectors covering low-and high-tech product manufacturing industries with high environmental productivity, end-consumer visibility and good potential for further transformation (for the full list of expert, please see World Economic Forum - Accenture, 2018, pp. 47–49). We aggregated and utilized the acquired data from this study (Figures 3, 5, 7 and 9 in the White Paper) as foundational data for this study. It should be noted that the WEF report evaluates the 40 disruptive applications. This paper only focused on Industry 4.0 technologies. Their 40 applications include various Industry 4.0 technologies, biotechnology and traditional manufacturing system elements. Their corresponding relationships appear in the report. For example, Semiconductor fab 4.0 is a disruptive application in the electronics industry. It refers to the application of advanced manufacturing techniques to the production of electronic components such as silicon wafer fabrication, semiconductors and microchips – and energy and resource intensive set of processes. It contains key Industry 4.0 technologies – Cloud computing, Big data and analytics, Cobotic systems and Artificial intelligence, according to the McKinsey White Paper. The value of sustainability for Semiconductor fab 4.0 is very plausible for those four Industry 4.0 technologies. HFS is used to represent and address this uncertainty of Industry 4.0 technologies business and sustainability performance originating from the diverse and complementary disruptive applications. 4.2. Proposed methodology The proposed multi-stage methodology utilizing HFS, CPT, and VIKOR, is composed of 10 steps. These steps are detailed with exemplary calculations explicitly identified. Step 1: Construct an Industry 4.0 technologies evaluation system. An evaluation system T ¼ (U, P, C, H) for Industry 4.0 technologies based on various sustainability attributes is identified in this step. U ¼ {x1, x2, …, xn} is a set of n evaluated Industry 4.0 technologies – we will use I4.0T from now. Pt ¼ {pt1, pt2, …, ptn} is a set of probabilities of using n I4.0T in industry t, where Pn i¼1pti¼ 1. C ¼ {c1, c2, …, cm} is a set of m sustainability attributes which are used to evaluate the I4.0T. H ¼ {ht i;k, i ¼ 1, …, n, k ¼ 1, …, m and t ¼ 1, …, T } is the HFE value of I4.0T i for sustainability attribute ck in industry t. For this empirical case, a total of n ¼ 17 potential I4.0T will be in the evaluation: additive manufacturing, artificial intelligence, augmented reality, autonomous robots, big data and analytics, blockchain, cloud, cobotic systems, cybersecurity, drones, GPS, Industrial Internet of Things, mobile technology, nanotechnology, RFID, sensors and actuators and simulation (see Table 2). Each I4.0T is evaluated on m ¼ 14 sustainability attributes (SDGs). These attributes and values are from the WEF White Paper. There are four economic impact attributes: End Poverty (EP), Decent Work and Economic Growth (DWEG), Industry, Innovation and Infrastructure (III), Reduced Inequalities (RI). There are four social impact attributes: End Hunger (EH), Gender Equality (GE), Good Health and Well-being (GHW), Quality Education (QE). There are six environmental impact attributes: Clean Water and Sanitation (CWS), Affordable and Clean Energy (ACE), Sustainable Cities and Communities (SCC), Responsible Consumption and Production (RCP), Life Below Water (LBW), Life on Land (LL). Step 2: Convert application performance values into I4.0T hesitant fuzzy elements. I4.0T are not necessarily applied individually and separately. Often multiple I4.0T are applied to various disruptive industry applications each having a different performance outcome. For example, short-loop recycling in the automotive industry may utilize sensors, clouds, and big data analytics. In this multi-context decision-making environment, it is difficult for experts to evaluate each technology’s sustainability performance. There are many disruptive applications in different industries. For example, artificial intelligence (an I4.0T) can be used in various disruptive applications in the automotive industry, such as Short Loop Recycling for Manufacturing, Cobotics 2.0, Smart Digital Twins, Robotic disassembly for remanufacturing, and Smart Warehouse Robotics. The performance of those five disruptive applications can be used as a reference for the performance of artificial intelligence. A specific I4.0T may appear multiple times in different applications of one industry. In this uncertain and diverse environment, all performance values of an I4.0T for different applications can be converted into a HFE of an industry I4.0T. In this case, a value repeated more times has no more importance than other values repeated fewer times (Xu and Xia, 2011). Hence, deleting repeated values and arranging those values in decreasing order, the results evaluated in the different applications of one industry are contained in a hesitant fuzzy decision matrix, as shown in Table 3, where ht i;k are in the form of HFEs for I4.0T xi, attribute ck, and industry t. In the empirical case, artificial intelligence x2 has been applied to five different disruptive applications (Short Loop Recycling for Manufacturing, Cobotics 2.0, Smart Digital Twins, Robotic disassembly for remanufacturing, and Smart Warehouse Robotics) in the automobile industry, which yields five performance results 2, 3, 2, 2 and 2 for SDG attribute c1 (EP – ending poverty SDG). Each value uses a 0–4 scale to indicate no impact, low impact, medium impact, medium high impact, and high impact, respectively. After deleting repeated values and arranging those values in decreasing order, performance values in different applications can be converted into an HFE h1 2;1 ¼ (3, 2); appearing in the Artificial Intelligence row and EP column of Table 3. Due to space constraints, the hesitant fuzzy decision matrices of other three industries are not shown. Step 3: Calculate the HFE value function for each I4.0T SDG attribute Since SDG attribute values are HFE, the CPT value function (expression (5)) needs to be altered to calculate the HFE attribute value function. This study considers every I4.0T as a reference point for the risk aversion attitudes of decision makers. Using CPT and HFEs, the value function ϕπht i;kÞj of I4.0T xi and I4.0T xj (the reference point) for SDG attribute k in industry t is determined by expression (14): ztij;k Όϕ�hti;k�j Όnshti;k� 􀀀 s�htj;k��α; s�hti;k�>s�htj;k� 􀀀 λ 􀀀 shtj;k� 􀀀 s�hti;k���β; s�hti;k��s�htj;k� (14) For this case, the HFE of I4.0T x1 and I4.0T x2 are (3) and (3, 2) for attribute c1 (EP) in the automobile industry t ¼ 1. We find sðh1 1;1Þ ¼ 11\* 3 ¼ 3and sðh1 2;1Þ ¼ 12ð3 þ 2Þ ¼ 2:5, and the value function z112;1 ¼ ð3 􀀀 2:5ÞαΌ π0:5ÞαΌ0:88 ¼ 0.543. The value function calculation results are used to construct the value function matrix among I4.0T for attribute c1 (EP) in automobile industry t ¼ 1. The value function matrix is shown in Table 4. Due to space constraints, the value function of other attributes and other industries are not shown. Step 4: Calculate value function decision weights Using the value function ztij; k and technology probabilities Pt ¼ {pt1, pt2, …, ptn}, the value function cumulative decision weights ππpÞcan be calculated. This step is divided into three sub-steps. Sub-step 4.1 Calculate the probabilities of each I4.0T. The probability of each I4.0T needs to be calculated, and in this case represents the percentage of appearances across industry applications. The probabilitypti¼ NtiPn i¼1Nti refers to the probability of the I4.0T xi appearing in an industry. Nti refers to the number of times I4.0T xi appears in all industry t applications. Sub-step 4.2 Rank order of the value functions. An increasing rank order of the value functions ztij; k is determined by comparing ztij; k of each I4.0T xiover all other I4.0T for an attribute ck in industry t. For example, the ranking result is noted as zt ð1Þ ij;k � zt ð2Þ ij;k � … � 0 � … � zt ðnÞ ij;k , where zt ðoÞ ij;k is the oth smallest rank among ztij; k. Correspondingly, according to zt ð1Þ ij;k � zt ð2Þ ij;k � … � 0 � … � zt ðnÞ ij;k , the probability of each I4.0T is ptðoÞ, ptðoÞ 2 fpt1; pt2; :::; ptng. Sub-step 4.3 Calculate the decision weights of the value function. The decision weights πþðptðoÞÞ or π􀀀 ðptðoÞÞcan be determined for the possible values fpt1; pt2; ::: ; ptng using expressions (6) and (7). In our case, the occurrences of the 14 I4.0T in the automobile industry are 1, 5, 1, 4, 5, 1, 5, 1, 4, 1, 1, 2, 4, and 1 respectively. Thus, the probabilities of these I4.0T xi are 2.78%, 13.89%, 2.78%, 11.11%, 13.89%, 2.78%, 13.89%, 2.78%, 11.11%, 2.78%, 2.78%, 5.56%, 11.11%, and 2.78%. Second, an increasing rank order is determined by comparing the ztij; k of each I4.0T xi to other I4.0T. The ranking result is: 0 ¼ z1 ð1Þ 11;1 ¼ z1 ð2Þ 18;1 ¼ z1 ð3Þ 1 11;1 < z1 ð4Þ 12;1 ¼ z1 ð5Þ 14;1 ¼ z1 ð6Þ 15;1 ¼ z1 ð7Þ 17;1 ¼ z1 ð8Þ 19;1 ¼ z1 ð9Þ 1 13;1 < z1 ð10Þ 13;1 ¼ z1 ð11Þ 16;1 ¼ z1 ð12Þ 1 10;1 ¼ z1 ð13Þ 1 12;1 ¼ z1 ð14Þ 1 14;1 . Correspondingly, according to the ranking results, the probability of I4.0T ptðoÞ are noted as p1ð1Þ; p1ð2Þ;⋯; p1ð14Þ ¼ 2.78%, 2.78%, …, 2.78%. Using expressions (6) and (7), the cumulative decision weights for value z1 1j; 1 are 0.023, 0.149, 0.057, 0.120, 0.149, 0.057, 0.149, 0.023, 0.120, 0.057, 0.023, 0.099, 0.120, and 0.057, respectively. The cumulative decision weights are shown in Table 5. Step 5: Calculate the cumulative prospect value for each SDG attribute and each I4.0T Using the value function zt ðoÞ ij;k , decision weights πþðoÞ and π􀀀ðoÞ, the cumulative prospect value ϕt i;k of I4.0T xi for SDG attribute ck in industry t can be calculated by expression (15). ϕti;k ¼ XO o¼1 zðdÞπ􀀀ðdÞ þ Xn o¼Oþ1 zðdÞπþðdÞ (15) For example, end poverty (EP) of I4.0T x1 has 14 value functions for performance 0, 0.543, 1, 0.543, 0.543, 1, 0.543, 0, 0.543, 1, 0, 1, 0.543, 1 corresponding to all I4.0T and 14 decision weights: 0.023, 0.149, 0.057, 0.12, 0.149, 0.057, 0.149, 0.023, 0.12, 0.057, 0.023, 0.099, 0.12, 0.057. According to expression (15), the prospect value ϕ1 1;1of I4.0T x1 is:ϕ1 1;1 ¼ 0 \* 0.023 þ … … þ(1\*0.057)) ¼ 0.756. The cumulative prospect values of I4.0T on each automobile industry SDG are shown in Table 6. Step 6: Determine the ideal I4.0T solution for each industry The ‘ideal’ I4.0T X\*t for each industry will be the maximum value from each sustainability (SDG) attribute in each industry t, as in expression (16). X\*t ¼nmax i ϕti;ko (16) Using expression (16) for this case problem we have: X\*t;k¼ { 0.765, 1.291, 0.596, 0.814, 0.270, 0.415, 0.000, 0.508, 0.617, 0.860, 0.850, 0.114, 0.860, 0.228 } Step 7: Determine sustainability (SDG) attribute weights In this case, we use a simple and exact normalization formula for determining the weight of SDG attribute k using expression (17): wk ¼ Vk Pm k¼1 Vk (17) where Vk ¼ 1 T\*n2PTt¼1Pn i¼1Pnj¼1dðht i;k; htj;kÞ is the average difference between I4.0T for an SDG attribute k. n is the total number of I4.0T. dðht i;k; htj;kÞ is the Hamming distance measure between ht i;k and htj;k which is defined in expression (3). The overall attribute weight summary results appear in Table 7. Step 8: Calculate the group utility Si and the maximal regret Qi in an industry The values Si and Qi are calculated using expressions (11) and (12). For example, sustainability attribute c1 (EP) of I4.0T x1 is calculated as w1ð��� Xþ1;1 􀀀 ϕ1 1;1���Þ=ð�� �Xþ1;1 􀀀 X􀀀 1;1���Þ ¼ 0:104\* �0:765 􀀀 0:765=0:765 þ 1:470� ¼ 0. The value S1 for I4.0T x1 in automobile industry t is Pm k¼1½wkð�� �Xþ1;k 􀀀 ϕ1 1;k���Þ =ð��� Xþ1;k 􀀀 X􀀀 1;k���Þ� ¼ 0.530 for all attributes. The value Q1 for I4.0T x1 in the automobile industry is the max of above values and calculation result is w8ð�� �Xþ1;8 􀀀 ϕ1 1;8���Þ= ð�� �Xþ1;8 􀀀 X􀀀 1;8���Þ ¼ 0:087\*�0:86 þ 1:341=0:86 þ 1:341� ¼ 0.087 for attribute c8(DWEG). Step 9: Compute Ri (sustainability index) in an industry In our application, we set parameter v ¼ 0.5, which implies the maximum group utility weight equals the individual regret weight. We then get Sþ ¼ 0.214, S􀀀 ¼ 0.675, Qþ ¼ 0.087, and Q􀀀 ¼ 0.104. The value R1 of I4.0T x1 Ri ¼ vðS􀀀 􀀀 SiÞ=ðS􀀀 􀀀 SþÞþ ð1 􀀀 vÞðQ􀀀 􀀀 QiÞ=ðQ􀀀 􀀀 QþÞ ¼ 0.658. The values Si, Qi, and Ri for other I4.0T appear in Table 8 across various industries. Step 10: Calculate Cross-Industry Aggregated Index Values Ri for I4.0T The cross-industry cumulative prospect value for I4.0T based on the sustainability (SDG) measures is calculated using expression (18). Ri ¼ 1T XT t¼1 Rti(18) The calculated aggregated degrees Ri of I4.0T are shown in Table 8 (last column) and Fig. 1. The results show that overall – based on the cross-industry, cross-application case report – mobile technology has the highest degree in contributing to sustainability attributes with a score of 0.593. Augmented reality has the lowest sustainability degree with a score of 0.030. 4.3. Sensitivity analysis A joint HFS, CPT and VIKOR method is used to evaluate I4.0T. In this section, sensitivity analysis is completed to determine methodological robustness by evaluating variations of the methodology. We develop three models and compare them with the original method to show that the three approaches – HFS, CPT and VIKOR – we complementarily integrate are each necessary. The three models include: Model 1 – we apply a triangular fuzzy number ~z ¼ ðl; m; rÞ instead of HFS; Model 2 – we remove CPT from the original method; Model 3 – we do not apply the VIKOR method from the original method. We only evaluate these three model versions for the automotive industry for sensitivity illustrative purposes. The final results are summarized in Table 9. We find that rank results from the Model 1 variation causes a very significant change. As can be seen by the rankings the discriminatory power of the first model decreases versus the HFS model. That is, there are many ties in the rankings. This result shows that triangular fuzzy numbers does not reliably express clearly defined rankings for different technologies and is not as suitable for decision-making or policy setting. From amongst the three alternative sensitivity models, Model 2 has the smallest change in ranks. But there are subtle differences. This result shows that human decision behavior under uncertainty or risk should be considered in this evaluation. We found that some I4.0T valuations have changed fundamentally when applying Model 3. For example, additive manufacturing and cybersecurity changed from a two ranking to a nine ranking. This result shows that although the overall performances of these two I4.0T are low, the performance is relatively balanced without too many very poor attributes. VIKOR can evaluate these I4.0T from a holistic perspective and avoid some risks that derives from poor performance of some sustainability attributes. Overall, our conclusion is that it is necessary to address sustainability concerns from a holistic perspective with multiple complementary methodologies (Bai and Sarkis, 2019). 5. Case study results and discussion The method proposed (see Section 3) and the case study application (see Section 4) allows us to compare various I4.0T in terms of their contribution to the three dimensions of sustainability (economic, environmental and social) across different industries. The results are based on the input data – drawn from the WEF report – which reflect opinions of the experts contributing to the WEF study. We present and discuss them in order to show: (a) the capacity of the proposed methodology to comprehensively evaluate I4.0T; and (b) some preliminary results of the comparisons of I4.0T in terms of their contribution to sustainability. We complete three comparative analyses: among industries (Section 5.1), among sustainability dimensions (Section 5.2), and among sustainability dimensions and industries (Section 5.3). 5.1. Comparative analysis among industries The first comparative analysis is the impact of I4.0T to sustainability across different industries. The calculated degrees Ri of I4.0T industry sustainability impacts are shown in Table 8 and Fig. 1. This analysis shows that I4.0T have a very different sustainability impact – from 0.030 of augmented reality to 0.593 of mobile technology – with a strong industry context dependence (see Table 8). Unfortunately we cannot compare this finding with previous Industry 4.0 studies since this study paper is – to the best of our knowledge – the first one to compare various I4.0T in terms of their contribution to society’s sustainability. This result will have two significant implications for future Industry 4.0 research. First, while extant Industry 4.0 literature has usually considered I4.0T as a group of technologies without making distinctions among them (e.g., Kagermann et al., 2011; Xu et al., 2018), it seems that a more granular approach considering each I4.0T separately can provide additional insights. Second, a more contingency-based, multi-contextual approach – at least with reference to the industry – is advisable since I4.0T have very different applications and impacts in different industries (see below). As far as the automotive industry is concerned, nanotechnology is the best I4.0T for improving sustainability with a sustainability score equal to 0.887; see Table 8. This result – which is not surprising – is due to the potential contribution of nanotechnology to the development of lightweight bio-based plastics and composites. This outcome can contribute to reduce the fuel consumption, the CO2 emissions of vehicles and the use of petroleum-based plastics, relating to economic and environmental sustainability. It may also improve the livelihoods for farmers; relating to social sustainability (World Economic Forum (WEF)Accenture, 2018). Similarly, mobile technology appears as the highest scoring I4.0T in the electronics industry with an overall sustainability score equal to 1; see Table 8. This result is related to contribution of this technology to the traceability of (rare) minerals used in this industry as well as to the autonomous disassembly of electronics equipment to recycle/reuse their components. Both of these activities have significant implications for all the three sustainability dimensions (World Economic Forum (WEF) Accenture, 2018). More surprising results appear in the food and beverage, and the textiles, apparel and footwear industries. Interestingly, simulation is the I4.0T with greatest implications for improving sustainability in the food and beverage industry; a sustainability score equal to 1 in Table 8. This reason behind this high scoring for simulation is related to its potential contribution to genome editing. This application might lead to increased yield which is an economic and social sustainability contribution; for example through SDG2 zero hunger. It can also lead to decreased water usage; an environmental sustainability measure. Genome editing can contribute to increased tolerance to challenging weather conditions (World Economic Forum (WEF)Accenture, 2018). Drones are the most sustainable I4.0T in the textiles, apparel and footwear industry; with a sustainability score equal to 1, see Table 8. Drones have potential contribution to advance bio farming and precision agriculture for fiber crops (World Economic Forum (WEF)Accenture, 2018). 5.2. Comparative analysis among sustainability dimensions The second comparative analysis is the impact of I4.0T across the TBL sustainability dimensions. The aggregated degrees Ri of I4.0T are shown in Fig. 2 for economic (a), environmental (b) and social (c) dimensions. We found that blockchain technology is the most economically sustainable I4.0T (score of 0.632); confirmed by recent literature (Zhang, 2019; Grigoras et al., 2018; Cocco et al., 2017). According to Fig. 2, blockchain technology is followed by mobile technology with a score of 0.605. This is also underpinned by literature with example applications such as reduction of food waste in restaurant chains, enabling smart urban mobility and increasing productivity by means of the fifth generation of mobile technology (5G) (Hajjdiab et al., 2018; Lyons, 2018; Annunziato, 2015). Our findings show that sensors and actuators are the most environmentally sustainable I4.0T – sustainability score of 0.692. This score is closely followed by artificial intelligence (0.670), big data and analytics (0.635), and cloud (0.621). These technologies provide both hard (sensors and actuators) and soft (artificial intelligence, big data and analytics, and cloud) infrastructure for addressing energy and resource efficiency in production activities. The impact of cloud technology on environmental sustainability – from higher efficiency in materials usage, reduced use of toxic materials, and lower impact on effluents and wastes – was highlighted in Schniederjans and Hales (2016). Finally, cloud technology is the most socially sustainable I4.0T with a score of 0.646. Big data and analytics follows with a score of 0.623. This result – somewhat unexpected considering the ethics, privacy and personal autonomy issues related to the sharing of data and applications on the cloud (e.g., Isaias, 2015) – can be explained by the experts’ opinions that both cloud and big data and analytics significantly contribute to various socially influential applications. These applications include augmented workforce, robotic disassembly for remanufacturing bio-based plastics and composites, digital traceability of minerals, advanced electronic design automation, precision agriculture, and advanced bio-farming and vertical farming (World Economic Forum (WEF)Accenture, 2018). Future research is needed on these aspects, in particular with a more complete consideration of the potential negative sustainability impacts of each technology. 5.3. Comparative analysis among dimensions in each industry A complete comparative analysis of sustainability degrees Ri of each I4.0T across different sustainability dimensions in each industry is summarized in Table 10. Considering the economic sustainability perspective, Industrial Internet of Things (IoT) has a high score in the food and beverage industry (Table 10). IoT is used with other technologies such as GPS, soil sensors and weather data in the field of precision agriculture to integrate data and analytics with crop science to enable scientific farming decisions (World Economic Forum (WEF)Accenture, 2018). As such, it supports the optimization of resource usage in the fields of fertilizer, irrigation, harvesting time and seed spacing (Sambo et al., 2019). Alternatively, nanotechnology has a very low impact on increasing the economic sustainability in the textiles, apparel and footwear industry even given the medium-term perspective (5–10 years) developments; nano-tech enhanced fabrics are expected (World Economic Forum (WEF)Accenture, 2018). For the environmental sustainability dimension, autonomous robots and cobotic systems seem to have a high impact in the automotive and electronics industries (Table 10). Cobotic systems can support production in an energy and resource efficient way of electronic components. This may especially be true for silicon wafer fabrication and microchips, especially in emerging markets where there is a significant potential for efficiency gains (World Economic Forum (WEF)Accenture, 2018). Alternatively, autonomous robots seem to have little influence to increase environmental sustainability in the food and beverage industry (Table 10). This result can be explained by considering that this industry can be classified as a process industry that is generally characterized by a high-automation degree and a continuous production flow. Finally, for the social sustainability dimension, big data and analytics seem to have the highest impact in the automotive industry. Recent applications in this field are the systematic gathering and analysis of car consumer reviews to figure out the perceived advantages and disadvantages of selected vehicles (Dremel et al., 2018; Kim and Chun, 2019). Alternatively, artificial intelligence seems have little influence of I4.0T for improving social sustainability in the food and beverage industry. Even if artificial intelligence could make a significant contribution in the (analysis) and extrapolation of meaningful information from field data, the agriculture industry is faced by relatively more unpredictable events like changing weather conditions, changes in soil quality, and the unexpected influence of pests and diseases. As such, farmers may feel that their harvest will be good, but until that day arrives, the outcome will always be uncertain (Byrum, 2017). As a result, a limited impact of this technology to the social dimension can be expected because an extreme quantity of factors needs to be considered and two environments are improbably likely to be exactly the same. This environment makes the testing, validation and successful implementation of these technologies much more difficult than in other industries (Byrum, 2017). 5.4. Implications for business and government The proposed multi-contextual decision-making method for evaluating the impact of I4.0T on the three sustainability dimensions – economic, environmental and social – can be applied by both managers and policy makers for evaluating sustainability priorities and which technologies to adopt or to foster through policy interventions. The evaluation focus is enlarged from a merely economic perspective to a broader– although more complex – view in terms of environmental and social sustainability dimensions. The proposed method and results are for an empirical case, using secondary published data from a WEF report (World Economic Forum - Accenture, 2018). This information allowed us to provide insights for both managers and policy makers. Insights include evidence of the potential impact of different technologies across various sustainability dimensions and attributes in four key industries – automotive, electronics, food and beverage, textiles, apparel and footwear. As an example, according to our results (see Section 5.3) companies in the automotive industry may decide to invest in autonomous robots and cobotic systems to improve industrial and organizational environmental sustainability dimensions. Big data and analytics in this industry can effectively address social sustainability concerns. In this way we significantly support organizations and industry in their decision-making processes. Policy makers – depending on their relative concerns and community or constituent pressures they face – can incentivize and support development of particular technologies in a given industry. From a supply chain perspective companies and industrial sectors may gain competitive advantage through building sustainability performance; making companies in regions and industries more competitive for those product families and supply chains seeking to build more sustainable products and materials. Finally, the empirical case results highlights the existence of interrelationships and sometimes trade-offs between the impacts of the different I4.0T on the three sustainability dimensions These interrelationships and tradeoffs vary across different industrial sectors. The interrelationship make policy decision-making processes more complex, difficult, and with greater uncertainty. For instance, if regulators decide to support industry investment in autonomous robots and cobotic systems– increasing environmental sustainability – the resulting impact may be a negative effect on the level of employment in the automotive industry; thus, decreasing the social sustainability. The methodology provides some insights into these varying interrelationships and tradeoffs that may not only exist across technologies and sustainability dimensions, but also across industries. 6. Conclusion The applications of Industry 4.0 technologies for sustainable development seem to attract increasing attention from practitioners and scholars (Beltrami and Orzes, 2019). This attention will increase given industry’s global influence on sustainability through its supply chains, products, and processes. Some current literature examines Industry 4.0 predominantly from an organizational sustainability perspective, whereas few articles consider aspects of overall society’s sustainability; especially using the United Nations’ Sustainable Development Goals (SDGs). However, it is essential to understand the potential of I4.0T for achieving society’s sustainability through successful technology adoption and diffusion.

#### Warming causes extinction

Dr. Yew-Kwang Ng 19, Winsemius Professor of Economics at Nanyang Technological University, Fellow of the Academy of Social Sciences in Australia and Member of Advisory Board at the Global Priorities Institute at Oxford University, PhD in Economics from Sydney University, “Keynote: Global Extinction and Animal Welfare: Two Priorities for Effective Altruism”, Global Policy, Volume 10, Number 2, May 2019, pp. 258–266

Catastrophic climate change Though by no means certain, CCC causing global extinction is possible due to interrelated factors of non-linearity, cascading effects, positive feedbacks, multiplicative factors, critical thresholds and tipping points (e.g. Barnosky and Hadly, 2016; Belaia et al., 2017; Buldyrev et al., 2010; Grainger, 2017; Hansen and Sato, 2012; IPCC 2014; Kareiva and Carranza, 2018; Osmond and Klausmeier, 2017; Rothman, 2017; Schuur et al., 2015; Sims and Finnoff, 2016; Van Aalst, 2006).7 A possibly imminent tipping point could be in the form of ‘an abrupt ice sheet collapse [that] could cause a rapid sea level rise’ (Baum et al., 2011, p. 399). There are many avenues for positive feedback in global warming, including: • the replacement of an ice sea by a liquid ocean surface from melting reduces the reflection and increases the absorption of sunlight, leading to faster warming; • the drying of forests from warming increases forest fires and the release of more carbon; and • higher ocean temperatures may lead to the release of methane trapped under the ocean floor, producing runaway global warming. Though there are also avenues for negative feedback, the scientific consensus is for an overall net positive feedback (Roe and Baker, 2007). Thus, the Global Challenges Foundation (2017, p. 25) concludes, ‘The world is currently completely unprepared to envisage, and even less deal with, the consequences of CCC’. The threat of sea-level rising from global warming is well known, but there are also other likely and more imminent threats to the survivability of mankind and other living things. For example, Sherwood and Huber (2010) emphasize the adaptability limit to climate change due to heat stress from high environmental wet-bulb temperature. They show that ‘even modest global warming could ... expose large fractions of the [world] population to unprecedented heat stress’ p. 9552 and that with substantial global warming, ‘the area of land rendered uninhabitable by heat stress would dwarf that affected by rising sea level’ p. 9555, making extinction much more likely and the relatively moderate damages estimated by most integrated assessment models unreliably low. While imminent extinction is very unlikely and may not come for a long time even under business as usual, the main point is that we cannot rule it out. Annan and Hargreaves (2011, pp. 434–435) may be right that there is ‘an upper 95 per cent probability limit for S [temperature increase] ... to lie close to 4°C, and certainly well below 6°C’. However, probabilities of 5 per cent, 0.5 per cent, 0.05 per cent or even 0.005 per cent of excessive warming and the resulting extinction probabilities cannot be ruled out and are unacceptable. Even if there is only a 1 per cent probability that there is a time bomb in the airplane, you probably want to change your flight. Extinction of the whole world is more important to avoid by literally a trillion times.

#### Environmental devastation causes extinction

Bradshaw, 21

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We report three major and confronting environmental issues that have received little attention and require urgent action. First, we review the evidence that future environmental conditions will be far more dangerous than currently believed. The scale of the threats to the biosphere and all its lifeforms—including humanity—is in fact so great that it is difficult to grasp for even well-informed experts. Second, we ask what political or economic system, or leadership, is prepared to handle the predicted disasters, or even capable of such action. Third, this dire situation places an extraordinary responsibility on scientists to speak out candidly and accurately when engaging with government, business, and the public. We especially draw attention to the lack of appreciation of the enormous challenges to creating a sustainable future. The added stresses to human health, wealth, and well-being will perversely diminish our political capacity to mitigate the erosion of ecosystem services on which society depends. The science underlying these issues is strong, but awareness is weak. Without fully appreciating and broadcasting the scale of the problems and the enormity of the solutions required, society will fail to achieve even modest sustainability goals. Introduction Humanity is causing a rapid loss of biodiversity and, with it, Earth's ability to support complex life. But the mainstream is having difficulty grasping the magnitude of this loss, despite the steady erosion of the fabric of human civilization ([Ceballos et al., 2015](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B31); [IPBES, 2019](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B78); [Convention on Biological Diversity, 2020](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B39); [WWF, 2020](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B156)). While suggested solutions abound ([Díaz et al., 2019](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B49)), the current scale of their implementation does not match the relentless progression of biodiversity loss ([Cumming et al., 2006](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B42)) and other existential threats tied to the continuous expansion of the human enterprise ([Rees, 2020](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B116)). Time delays between ecological deterioration and socio-economic penalties, as with climate disruption for example ([IPCC, 2014](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B79)), impede recognition of the magnitude of the challenge and timely counteraction needed. In addition, disciplinary specialization and insularity encourage unfamiliarity with the complex adaptive systems ([Levin, 1999](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B96)) in which problems and their potential solutions are embedded ([Selby, 2006](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B125); [Brand and Karvonen, 2007](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B19)). Widespread ignorance of human behavior ([Van Bavel et al., 2020](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B142)) and the incremental nature of socio-political processes that plan and implement solutions further delay effective action ([Shanley and López, 2009](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B127); [King, 2016](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B85)). We summarize the state of the natural world in stark form here to help clarify the gravity of the human predicament. We also outline likely future trends in biodiversity decline ([Díaz et al., 2019](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B49)), climate disruption ([Ripple et al., 2020](https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B118)), and human consumption and population growth to demonstrate the near certainty that these problems will worsen over the coming decades, with negative impacts for centuries to come. Finally, we discuss the ineffectiveness of current and planned actions that are attempting to address the ominous erosion of Earth's life-support system. Ours is not a call to surrender—we aim to provide leaders with a realistic “cold shower” of the state of the planet that is essential for planning to avoid a ghastly future.

#### **Independently, mismanaged tech regulation causes extinction via emerging threats**

Beckstead 14(Nick Beckstead, PhD-Rutgers, research fellow at the Future of Humanity Institute at Oxford University, oversees the Open Philanthropy Project’s grantmaking in global catastrophic risk reduction, and Toby Ord, Professor of Moral Philosophy at Oxford University and James Martin Research Fellow at the Future of Humanity Institute, Managing Existential Risk From Emerging Technologies, Ch. 10 of INNOVATION: MANAGING RISK, NOT AVOIDING IT, Annual Report of the Government Chief Scientific Adviser, 2014, <https://www.fhi.ox.ac.uk/wp-content/uploads/Managing-existential-risks-from-Emerging-Technologies.pdf>)

Historically, the risks that have arisen from emerging technologies have been small when compared with their benefits. The potential exceptions are unprecedented risks that could threaten large parts of the globe, or even our very survival . Technology has significantly improved lives in the United Kingdom and the rest of the world. Over the past 150 years, we have become much more prosperous. During this time, the UK average income rose by more than a factor of seven in real terms, much of this driven by improving technology. This increased prosperity has taken millions of people out of absolute poverty and has given everyone many more freedoms in their lives. The past 150 years also saw historically unprecedented improvements in health, with life expectancy in the United Kingdom steadily increasing by two to three years each decade. From a starting point of about 40 years, it has doubled to 80 years2 . These improvements are not entirely due to technological advances, of course, but a large fraction of them are. We have seen the cost of goods fall dramatically due to mass production, domestic time freed up via labour saving machines at home, and people connected by automobiles, railroads, airplanes, telephones, television, and the Internet. Health has improved through widespread improvements in sanitation, vaccines, antibiotics, blood transfusions, pharmaceuticals, and surgical techniques. These benefits significantly outweigh many kinds of risks that emerging technologies bring, such as those that could threaten workers in industry, local communities, consumers, or the environment. After all, the dramatic improvements in prosperity and health already include all the economic and health costs of accidents and inadvertent consequences during technological development and deployment, and the balance is still overwhelmingly positive. This is not to say that governance does or should ignore mundane risks from new technologies in the future. Good governance may have substantially decreased the risks that we faced over the previous two centuries, and if through careful policy choices we can reduce future risks without much negative impact on these emerging technologies, then we certainly should do so. However, we may not yet have seen the effects of the most important risks from technological innovation. Over the next few decades, certain technological advances may pose significant and unprecedented global risks. Advances in the biosciences and biotechnology may make it possible to create bioweapons more dangerous than any disease humanity has faced so far; geoengineering technologies could give individual countries the ability to unilaterally alter the global climate (see case study); rapid advances in artificial intelligence could give a single country a decisive strategic advantage. These scenarios are extreme, but they are recognized as potential low-probability high-impact events by relevant experts. To safely navigate these risks, and harness the potentially great benefits of these new technologies, we must continue to develop our understanding of them and ensure that the institutions responsible for monitoring them and developing policy responses are fit for purpose. This chapter explores the high-consequence risks that we can already anticipate; explains market and political challenges to adequately managing these risks; and discusses what we can do today to ensure that we achieve the potential of these technologies while keeping catastrophic threats to an acceptably low level. We need to be on our guard to ensure we are equipped to deal with these risks, have the regulatory vocabulary to manage them appropriately, and continue to develop the adaptive institutions necessary for mounting reasonable responses. Anthropogenic existential risks vs. natural existential risks An existential risk is defined as a risk that threatens the premature extinction of humanity, or the permanent and drastic destruction of its potential for desirable future development. These risks could originate in nature (as in a large asteroid impact, gamma-ray burst, supernova, supervolcano eruption, or pandemic) or through human action (as in a nuclear war, or in other cases we discuss below). This chapter focuses on anthropogenic existential risks because — as we will now argue — the probability of these risks appears significantly greater. Historical evidence shows that species like ours are not destroyed by natural catastrophes very often. Humans have existed for 200,000 years. Our closest ancestor, Homo erectus, survived for about 1.8 million years. The median mammalian species lasts for about 2.2 million years3 . Assuming that the distribution of natural existential catastrophes has not changed, we would have been unlikely to survive as long as we have if the chance of natural extinction in a given century were greater than 1 in 500 or 1 in 5,000 (since (1 – 1/500)2,000 and (1 – 1/5,000)18,000 are both less than 2%). Consistent with this general argument, all natural existential risks are believed to have very small probabilities of destroying humanity in the coming century4 . In contrast, the tentative historical evidence we do have points in the opposite direction for anthropogenic risks. The development of nuclear fission, and the atomic bomb, was the first time in history that a technology created the possibility of destroying most or all of the world’s population. Fortunately we have not yet seen a global nuclear catastrophe, but we have come extremely close. US President John F. Kennedy later confessed that during the Cuban missile crisis, the chances of a nuclear war with Russia seemed to him at the time to be “somewhere between one out of three and even”. In light of this evidence, it is intuitively rather unclear that we could survive 500 or 5,000 centuries without facing a technologically-driven global catastrophe such as a nuclear war. We argue that in the coming decades, the world can expect to see several powerful new technologies that — by accident or design — may pose equal or greater risks for humanity. 1. Engineered Pathogens Pandemics such as Spanish flu and HIV have killed tens of millions of people. Smallpox alone was responsible for more than 300 million deaths in the first half of the twentieth century. As the ongoing Ebola epidemic reminds us, disease outbreaks remain a potent threat today. However, pressures from natural selection limit the destructive potential of pathogens because a sufficiently virulent, transmissible pathogen would eliminate the host population. As others have argued, and we reiterate below, bioengineering could be used to overcome natural limits on virulence and transmissibility, allowing pandemics of unprecedented scale and severity. For an example of an increase in fatality rates, consider mousepox, a disease that is normally non-lethal in mice. In 2001, Australian researchers modified mousepox, accidentally increasing its fatality rate to 60%, even in mice with immunity to the original version5 . By 2003, researchers led by Mark Buller found a way to increase the fatality rate to 100%, although the team also found therapies that could protect mice from the engineered version6 . For an example of an increase in transmissibility, consider the ‘gain of function’ experiments on influenza that have enabled airborne transmission of modified strains of H5N1 between ferrets7 . Proponents of such experiments argue that further efforts building on their research “have contributed to our understanding of host adaptation by influenza viruses, the development of vaccines and therapeutics, and improved [disease] surveillance”8 . However, opponents argue that enhancing the transmissibility of H5N1 does little to aid in vaccine development; that long lag times between capturing and sequencing natural flu samples limits the value of this work for surveillance; and that epistasis — in which interactions between genes modulate their overall effects — limits our ability to infer the likely consequences of other genetic mutations in influenza from what we have observed in gainof-function research so far9 . Many concerns have been expressed about the catastrophic and existential risks associated with engineered pathogens. For example, George Church, a pioneer in the field of synthetic biology, has said: “While the likelihood of misuse of oligos to gain access to nearly extinct human viruses (e.g. polio) or novel pathogens (like IL4-poxvirus) is small, the consequences loom larger than chemical and nuclear weapons, since biohazards are inexpensive, can spread rapidly world-wide and evolve on their own.”10 Similarly, Richard Posner11, Nathan Myhrvold12, and Martin Rees13 have argued that in the future, an engineered pathogen with the appropriate combination of virulence, transmissibility and delay of onset in symptoms would pose an existential threat to humanity. Unfortunately, developments in this field will be much more challenging to control than nuclear weapons because the knowledge and equipment needed to engineer viruses is modest in comparison with what is required to create a nuclear weapon14. It is possible that once the field has matured over the next few decades, a single undetected terrorist group would be able to develop and deploy engineered pathogens. By the time the field is mature and its knowledge and tools are distributed across the world, it may be very challenging to defend against such a risk. This argues for the continuing development of active policy-oriented research, an intelligence service to ensure that we know what misuse some technologies are being put to, and a mature and adaptive regulatory structure in order to ensure that civilian use of materials can be appropriately developed to maximize benefit and minimize risk. We raise these potential risks to highlight some worstcase scenarios that deserve further consideration. Advances in these fields are likely to have significant positive consequences in medicine, energy, and agriculture. They may even play an important role in reducing the risk of pandemics, which currently pose a greater threat than the risks described here. 2. Artificial Intelligence Artificial intelligence (AI) is the science and engineering of intelligent machines. Narrow AI systems — such as Deep Blue, stock trading algorithms, or IBM’s Watson — work only in specific domains. In contrast, some researchers are working on AI with general capabilities, which aim to think and plan across all the domains that humans can. This general sort of AI only exists in very primitive forms today15. Many people have argued that long-term developments in artificial intelligence could have catastrophic consequences for humanity in the coming century16, while others are more skeptical17. AI researchers have differing views about when AI systems with advanced general capabilities might be developed, whether such development poses significant risks, and how seriously radical scenarios should be taken. As we’ll see, there are even differing views about how to characterize the distribution of opinion in the field. In 2012, Müller and Bostrom surveyed the 100 most-cited AI researchers to ask them when advanced AI systems might be developed, and what the likely consequences would be. The survey defined a “high-level machine intelligence” (HLMI) as a machine “that can carry out most human professions at least as well as a typical human”, and asked the researchers about which year they would assign a 10%, 50% or 90% subjective probability to such AI being developed. They also asked whether the overall consequences for humanity would be “extremely good”, “on balance good”, “more or less neutral”, “on balance bad”, or “extremely bad (existential catastrophe)”. The researchers received 29 responses: the median respondent assigned a 10% chance of HLMI by 2024, a 50% chance of HLMI by 2050, and a 90% chance of HLMI by 2070. For the impact on humanity, the median respondent assigned 20% to “extremely good”, 40% to “on balance good”, 19% to “more or less neutral”, 13% to “on balance bad”, and 8% to “extremely bad (existential catastrophe)”18. In our view, it would be a mistake to take these researchers’ probability estimates at face value, for several reasons. First, the AI researchers’ true expertise is in developing AI systems, not forecasting the consequences for society from radical developments in the field. Second, predictions about the future of AI have a mixed historical track record19. Third, these ‘subjective probabilities’ represent individuals’ personal degrees of confidence, and cannot be taken to be any kind of precise estimate of an objective chance. Fourth, only 29 out of 100 researchers responded to the survey, which therefore may not be representative of the field as a whole. The difficulty in assessing risks from AI is brought out further by a report from the Association for the Advancement of Artificial Intelligence (AAAI), which came to a different conclusion. In February 2009, about 20 leading researchers in AI met to discuss the social impacts of advances in their field. One of three sub-groups focused on potentially radical long-term implications of progress in artificial intelligence. They discussed the possibility of rapid increases in the capabilities of intelligent systems, as well as the possibility of humans losing control of machine intelligences that they had created. The overall perspective and recommendations were summarized as follows: • “The first focus group explored concerns expressed by lay people — and as popularized in science fiction for decades — about the long-term outcomes of AI research. Panelists reviewed and assessed popular expectations and concerns. The focus group noted a tendency for the general public, science-fiction writers, and futurists to dwell on radical longterm outcomes of AI research, while overlooking the broad spectrum of opportunities and challenges with developing and fielding applications that leverage different aspects of machine intelligence.” • “There was overall skepticism about the prospect of an intelligence explosion as well as of a “coming singularity,” and also about the large-scale loss of control of intelligent systems. Nevertheless, there was a shared sense that additional research would be valuable on methods for understanding and verifying the range of behaviors of complex computational systems to minimize unexpected outcomes.” • “The group suggested outreach and communication to people and organizations about the low likelihood of the radical outcomes, sharing the rationale for the overall comfort of scientists in this realm, and for the need to educate people outside the AI research community about the promise of AI for enhancing the quality of human life in numerous ways, coupled with a re-focusing of attention on actionable, shorter-term challenges.”20 This panel gathered prominent people in the field to discuss the social implications of advances in AI in response to concerns from the public and other researchers. They reported on their views about the concerns, recommended plausible avenues for deeper investigation, and highlighted the possible upsides of progress in addition to discussing the downsides. These were valuable contributions. However, the event had shortcomings as well. First, there is reason to doubt that the AAAI panel succeeded in accurately reporting the field’s level of concern about future developments in AI. Recent commentary on these issues from AI researchers has struck a different tone. For instance, the survey discussed above seems to indicate more widespread concern. Moreover, Stuart Russell — a leader in the field and author of the most-used textbook in AI — has begun publicly discussing AI as a potential existential risk21. In addition, the AAAI panel did not significantly engage with concerned researchers and members of the public, who had no representatives at the conference, and the AAAI panel did not explain their reasons for being sceptical of concerns about the long-term implications of AI, contrary to standard recommendations for ‘inclusion’ or ‘engagement’ in the field of responsible innovation22. In place of arguments, they offered language suggesting that these concerns were primarily held by “non-experts” and belonged in the realm of science fiction. It’s questionable whether there is genuine expertise in predicting the long-term future of AI at all23, and unclear how much better AI researchers would be than other informed people. But this kind of dismissal is especially questionable in light of the fact that many AI researchers in the survey mentioned above thought the risk of “extremely bad” outcomes for humanity from long-term 120 progress in AI had probabilities that were far from negligible. At present, there is no indication that the concerns of the public and researchers in other fields have been assuaged by the AAAI panel’s interim report or any subsequent outreach effort. What then, if anything, can we infer from these two different pieces of work? The survey suggests that some AI researchers believe that the development of advanced AI systems poses non-negligible risks of extremely bad outcomes for humanity, whilst the AAAI panel was skeptical of radical outcomes. Under these circumstances, it is impossible to rule out the possibility of a genuine risk, making a case for deeper investigation of the potential problem and the possible responses and including long-term risks from AI in horizon-scanning efforts by government. Challenges of managing existential risks from emerging technology Existential risks from emerging technologies pose distinctive challenges for regulation, for the following reasons: 1. The stakes involved in an existential catastrophe are extremely large, so even an extremely small risk can carry an unacceptably large expected cost24. Therefore, we should seek a high degree of certainty that all reasonable steps have been taken to minimize existential risks with a sufficient baseline of scientific plausibility. 2. All of the technologies discussed above are likely to be difficult to control (much harder than nuclear weapons). Small states or even non-state actors may eventually be able to cause major global problems. 3. The development of these technologies may be unexpectedly rapid, catching the political world off guard. This highlights the importance of carefully considering existential risks in the context of horizon-scanning efforts, foresight programs, risk and uncertainty assessments, and policy-oriented research. 4. Unlike risks with smaller stakes, we cannot rely on learning to manage existential risks through trial and error. Instead, it is important for government to investigate potential existential risks and develop appropriate responses even when the potential threat and options for mitigating it are highly uncertain or speculative. As we seek to maintain and develop the adaptive institutions necessary to manage existential risks from emerging technologies, there are some political challenges that are worth considering: 1. Reduction of the risk of an existential catastrophe is a global public good, because everyone benefits25. Markets typically undersupply global public goods, and large-scale cooperation is often required to overcome this. Even a large country acting in the interests of its citizens may have incentives to underinvest in ameliorating existential risk. For some threats the situation may be even worse, since even a single non-compliant country could pose severe problems. 2. The measures we take to prepare for existential risks from emerging technology will inevitably be speculative, making it hard to achieve consensus about how to respond. 3. Actions we might take to ameliorate these risks are likely to involve regulation. The costs of such regulation would likely be concentrated on the regulators and the industries, whereas the benefits would be widely dispersed and largely invisible — a classic recipe for regulatory failure. 4. Many of the benefits of minimizing existential risks accrue to future generations, and their interests are inherently difficult to incorporate into political decision-making. Conclusion In the coming decades, we may face existential risks from a number of sources including the development of engineered pathogens, advanced AI, or geoengineering. In response, we must consider these potential risks in the context of horizon-scanning efforts, foresight programs, risk and uncertainty assessments, and policy-oriented research. This may involve significant political and coordination challenges, but given the high stakes we must take reasonable steps to ensure that we fully realize the potential gains from these technologies while keeping any existential risks to an absolute minimum. [Inset] Case Study: Policy, Decisionmaking, and Existential Risk Geoengineering is the deliberate use of technology to alter planet-scale characteristics of the Earth, such as its climatic system. Geoengineering techniques have been proposed as a defence against global warming. For example, sulphate aerosols have a global cooling effect: by pumping sulphate aerosols into the high atmosphere, it may be possible to decrease global temperatures. Alternatively, seeding suitable ocean areas with comparatively small amounts of iron might increase plankton growth sufficiently to sequester significant quantities of atmospheric carbon dioxide. These technologies are already within reach, or nearly so (although their efficacy is still difficult to predict). As global warming worsens, the case for using one or more of them to ameliorate the causes or avert the effects of climate change may strengthen. Yet the long-term consequences of these techniques are poorly understood, and there may be a risk of global catastrophe if they were to be deployed, for example through unexpected effects on the global climate or the marine ecosystem. This example illustrates the policy dimensions of existential risk in several ways. 1. It involves potentially beneficial technologies that may come with a small (though difficult to assess) risk of catastrophic side effects. 2. These risks are associated with the fact that the technology is global in impact. If we choose to employ it, we are putting all our eggs in one basket. This is especially obvious in the case of geoengineering, because the technology is intended to have planetlevel effects. But it is also true of other potential sources of existential risk, such as synthetic biology or artificial intelligence, in the sense that it is unlikely that these technologies could be deployed merely locally — within a single nation, for example. 3. Some of the potential risks are associated with lock-in costs. If we choose one path now, it may be difficult or impossible to retreat later if unintended consequences become apparent — for example, there might be a risk of catastrophic sudden warming if the use of stratospheric aerosols was suddenly discontinued. 4. Once the technology is available, making a choice on its use is unavoidable — even a decision to do nothing is still a decision. Whatever we decide, our choice will have long-term consequences. However, geoengineering technology differs from some other potential sources of existential risk in that not using it is a feasible option, perhaps even the default option (at least for the time being). In other cases, various short-term benefits and associated commercial factors are likely to provide strong incentives to develop the technologies in question, and the task of managing extreme risks is to find opportunities to steer that development in order to reduce the probability of catastrophic surprises. 5. The decision to deploy geoengineering technology could, in principle, be made by a single nation or even a wealthy individual. In this respect, too, geoengineering illustrates one of the characteristic features of extreme technological risks: they are associated with the fact that powerful technologies put more power into fewer hands.

#### Antitrust uncertainty particularly deters foreign companies from investing in the US

Clougherty, 21

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A number of observers have recognized that antitrust enforcement can generate consequences for foreign firms considering to invest in a particular host country. Moreover, the relatively thin empirical literature on this topic presents mixed findings as to whether antitrust enforcement promotes or deters inward FDI activities. Some scholars find evidence in support of a positive relationship between antitrust and inward FDI, as foreign investors value the levelplaying-field aspects of antitrust that mitigate liability of foreignness. Yet other scholars find evidence in support of a negative relationship between antitrust and inward FDI, as the application of antitrust might tend to be protectionist in nature. This debate with regard to the relationship between antitrust and foreign investment has long roots, although the relevance of this debate has heightened over the last two decades (e.g., Carletti, Spagnolo, Caiazza, & Giannetti, 2010; Fingleton, 2009). With the aim of bringing some clarity to the above discourse, our conceptual framework generates two theoretical contentions. Our first theoretical prior contends that merger policy risk negatively affects the relative presence of foreign acquirers in local M&A markets. Merger policy risk likely involves a larger deterrence effect with respect to foreign investor activities as compared to domestic investor activities due to the presence of three mechanisms. First, foreign investors disproportionately experience the costs involved with navigating the merger review process due to their inherent liabilities and information asymmetries. Second, foreign investors tend to be more risk averse as compared to domestic investors, thus generating more cautious investment behavior. Third, antitrust agencies potentially exhibit bias and protectionism by disproportionately targeting and scrutinizing foreign investor acquisition activities. These three mechanisms first lead to reduced foreign investor participation in local M&A markets, and ultimately lead to the deterrence of future cross-border acquisitions as foreign investors refrain from such activities due to the presence of policy risks. In a similar vein, our second theoretical prior contends that merger policy uncertainty negatively affects the relative presence of foreign acquirers in local M&A markets. Merger policy uncertainty likely involves a larger deterrence effect with respect to foreign investor activities as compared to domestic investor activities due to the presence of substantial information asymmetries on the part of foreign investors. Investors hailing from foreign countries face particular disadvantages with respect to properly assessing the policy uncertainties associated with alterations in the future states of merger review. Thus, higher degrees of policy uncertainty regarding the future strength and tenor of the merger review process lead to reduced foreign investor participation in local M&A markets. In addition to negatively impacting foreign acquisitions of indigenous firms, this leads to the deterrence of future cross-border acquisitions as foreign investors refrain from such activities due to the presence of policy uncertainties.

#### Foreign direct investment prevents conflict escalation

Bryan Borzykowski, 7-6-18. CNBC business writer and editor quoting Mark Zandi, chief economist at Moody’s Analytics,” “The dire ripple effect from a US-China trade war: A drop in foreign investment worldwide,” CNBC. https://www.cnbc.com/2018/07/05/ripple-effect-from-pending-us-china-trade-war-drop-in-fdi-worldwide.html

The impact of lower FDI While FDI may not get the kind of attention that trade does, falling figures should be a concern for international investors and anyone who believes in globalization, said Bernard Wolf, an economics and international business professor at Toronto’s Schulich School of Business. “Both trade and FDI generally make the world a more efficient place,” he said. It can increase competition in markets, it brings people with new skills and knowhow to new countries and in the case of a merger of a public company, where one company buys another for a premium price, it can give investors a portfolio boost. “Globalization, including FDI, has enormous benefits,” he said. FDI also helps cooler heads prevail during conflicts, added Zandi. If countries are doing business with each other, they’ll be less likely to go to war with one another. “If your economic interests are aligned, and if we own a piece of their economy and they own a piece of ours, then everyone has skin in the game,” he said. “That’s a benefit we’re going to give up if we continue on this path.” In Zandi’s view, the timing for an FDI decline couldn’t be worse. As populations in emerging market countries move into the middle class, demand for developed market-made goods and services has never been higher. While he does say that globalization hasn’t benefited everyone, especially on the manufacturing side, more money will start flowing from China and other developing nations into America instead of vice-versa. “Pulling back now is a dark irony,” he said. “Countries like the U.S., Canada and the U.K. are producing things no one else on the planet is producing and we were really going to reap the benefits of that.” While American FDI into other countries is still robust ­— the U.S. invests about four times more into China than vice-versa — a global trade war could cause other countries to put restrictions on U.S. operations and that could impact domestic jobs and the American economy, said Hanemann. “That’s a major concern and something politicians in the U.S. aren’t talking about,” he said. “If we see a change in U.S. openness to Chinese investment, we will most certainly see a retaliation from China against U.S. investors. The U.S. has a lot more to lose from a more restrictive investment environment than China has.”

#### Dual enforcement has also caused the Axon case to rise to the Supreme Court, who will decide in favor of the plaintiff now. Doing so will strip the FTC of all regulatory power due to its unconstitutional antitrust action—only the aff solves by mooting the suit

Tyler 21, Eleanor Tyler, 7-29-2021, Eleanor Tyler is a Legal Analyst on the Litigation team, with a focus on antitrust. Previously, she spent seven years reporting for Bloomberg Law's antitrust news desk. Before joining Bloomberg Law in 2010, Eleanor was a litigation associate at a large law firm. She clerked for the Hon. Simeon Lake in the U.S. District Court for the Southern District of Texas. Her JD is from Georgetown University, and she holds an MA in international affairs from Johns Hopkins SAIS, "ANALYSIS: Axon’s SCOTUS Attack May Pose a Threat to the FTC," Bloomberg Law, https://news.bloomberglaw.com/bloomberg-law-analysis/analysis-axons-scotus-attack-may-pose-a-threat-to-the-ftc

A seemingly technical challenge to the Federal Trade Commission based on exhaustion of administrative remedies could upend the structure of the FTC’s enforcement efforts.

Former Solicitor General Paul D. Clement filed a petition for writ of certiorari before the U.S. Supreme Court July 20 on behalf of Axon Enterprise Inc., seeking to reverse lower court holdings that Axon must complete the FTC’s administrative enforcement process before challenging the constitutionality of that process in court.

Clement’s petition also asks the court to reach the merits of Axon’s challenge to the FTC’s administrative enforcement structure, which an Arizona federal court and the U.S. Court of Appeals for the Ninth Circuit held they lacked jurisdiction to consider.

Essentially, this is an attack on the entire structure of the FTC and its role in antitrust enforcement. For several reasons, the case stands a better-than-normal chance of being accepted by the Supreme Court and potentially dealing a serious blow to the FTC. The Court seems receptive to this kind of argument, and has proven receptive to the lawyer who makes it.

FTC Challenges Merger

Axon bought rival body camera manufacturer Vievu LLC in May 2018. The FTC opened an investigation into the merger shortly thereafter, and in December 2019, demanded that Axon spin off Vievu—with Axon’s technology—as a “cloned” competitor.

Facing an administrative enforcement action to force a breakup, Axon brought suit in Arizona federal court, alleging that the FTC’s administrative process is unconstitutional and seeking a declaratory judgment that the merger was legal.

Axon argued that the combination of “investigatory, prosecutorial, adjudicative, and appellate functions within a single agency” violates due process. Axon contended that if it has to litigate for years at the FTC before reaching a court that can consider its constitutional complaints and the merits of its defense to the merger challenge, then its due process rights are violated. Axon also contended that the FTC’s administrative law judge is improperly appointed, and thus can’t legally preside over Axon’s case, and that the whole process by which mergers are reviewed by the FTC or Justice Department is unconstitutional.

Judge Dominic Lanza of the federal district court held that district courts lack subject matter jurisdiction to weigh in on an FTC administrative enforcement matter because the FTC Act strips them of that ability. Under the Act, ALJ decisions at the FTC are reviewed by the Federal Trade Commission, whose decisions are in turn reviewed by an appellate court; that doesn’t leave room for the district court to interfere, Lanza said. Furthermore, because Axon will have a constitutional complaint only if the FTC administrative process concludes against Axon’s merger, he said, Axon may never even suffer a harm that needs adjudicating in court.

Axon appealed, countering that being forced through the very administrative process it challenges harms Axon regardless of outcome. The Ninth Circuit rejected its appeal in a split decision, reasoning that Congress’s adjudicative structure for FTC enforcement should be followed under existing Supreme Court precedent.

Clement petitioned SCOTUS to review the lower courts’ holdings on jurisdiction and reach the merits. The questions presented in his petition are:

Whether Congress [in the FTC Act] impliedly stripped federal district courts of jurisdiction over constitutional challenges to the FTC’s structure, procedures, and existence by granting the courts of appeals jurisdiction to “affirm, enforce, modify, or set aside” the Commission’s cease-and-desist orders; and

Whether, on the merits, the structure of the FTC, including the dual-layer for-cause removal protections afforded its administrative law judges, is consistent with the Constitution.

Receptive Court?

Under normal circumstances, one might not worry inordinately about a petition asking the Supreme Court to declare unconstitutional an agency structure that has been functioning admirably for 100 years.

For starters, any given petition for certiorari to the Supreme Court ordinarily has a lousy chance of being granted. According to U.S. Courts statistics, during the fiscal year ending Sept. 30, 2020, the Supreme Court had 5,518 petitions originating in the eleven appellate circuits (and D.C. circuit) pending consideration, and only 120 were granted—a success rate of 2.17%.

But Clement’s success rate for getting SCOTUS petitions heard is 10 times higher than that baseline success rate: A petition for certiorari with his name at the bottom has a one-in-five chance of being heard by the Court.

Second, the Court seems receptive to the types of arguments Axon is making, having taken a number of appointments clause cases in the past decade. In 2018, for example, in Lucia v. SEC, the Court held that the ALJs that preside over SEC administrative enforcement actions, which are similar to FTC actions, are “inferior officers.”

Axon is arguing that, under the Court’s 2010 decision in Free Enter. Fund v. Pub. Accounting Oversight Bd, “inferior officers” are inappropriately protected from removal by the president if they are removable only “for cause” by principal officers who likewise can only be removed “for cause.” Because the FTC ALJ can only be removed for cause, and those empowered to remove him can only be removed themselves for “inefficiency, neglect of duty, or malfeasance,” Axon argues the FTC’s “dual for-cause” structure protecting the ALJ violates the appointments clause under a “straightforward application” of Free Enter. Fund.

The court has also proved hostile to implied readings of the FTC Act. Just this April, the Court held that the FTC Act’s grant of power to seek a “permanent injunction” in court didn’t also imply the power to seek other equitable remedies like disgorgement, reversing decades of practice. Strictly on the jurisdictional issue of whether the courts can consider Axon’s constitutional claims before the FTC’s process concludes, the court may decline to read into the FTC Act a bar on Axon’s court case.

In short, the Court seems receptive to the kinds of arguments that Axon is advancing and Axon’s lawyer is exceptionally skilled at getting the Court to consider litigants’ arguments.

#### Successful *Axon* litigation overturns the entire *administrative state*

Victoria Graham, 1-10-2020, Graham had been at Bloomberg Industry Group since August 2017, covering antitrust policy and litigation. She reported on high-profile merger lawsuits (AT&T-Time Warner, Sprint-T-Mobile) as well as antitrust oversight by the Justice Department, Federal Trade Commission, state attorneys general, and Congress, "Axon Targets FTC Antitrust Power and Could Hit Other Agencies," Bloomberg Law, https://news.bloomberglaw.com/mergers-and-acquisitions/axon-targets-ftc-antitrust-power-and-could-hit-other-agencies

A police camera equipment and taser manufacturer’s challenge to a merger rejection could pose risks for federal agencies far beyond its intended target: the Federal Trade Commission.

Axon Enterprise Inc. is seeking to save its merger with a rival by challenging the FTC’s ability to both prosecute and judge cases and asking a federal court to rule the agency’s structure unconstitutional.

The case, the first of its kind in more than a decade, comes at a time when the FTC isn’t doing very well in federal court defending the reach of its power. The FTC has lost two such cases in the last year alone.

“Ten years ago I would have been surprised by this sort of suit but the FTC keeps getting socked,” Chris Sagers, an antitrust law professor at Cleveland State University, said.

The case poses risks well beyond the FTC since other agencies such as the Food and Drug Administration use similar in-house administrative processes as governed by a federal law known as the Administrative Procedure Act.

If the FTC’s process is found to be unconstitutional, “than there is more at stake than just the FTC,” Darren Bush, an antitrust law professor at the University of Houston, said.

“This lawsuit is a direct assault on the Administrative Procedure Act which makes it a much bigger case,” Sagers added.

Whole Foods

A company last challenged the FTC’s structure in 2008 when Whole Foods Market Inc. counter-sued the commission after it ordered the supermarket chain to unwind its $565 million acquisition of Wild Oats Markets. However, Whole Foods and the FTC quickly reached a settlement and the case was dismissed.

Axon’s suit “is a serious and sobering challenge, " Sagers said.

#### **The Administrative State solves everything**

Bazelon & Posner 17 -- Emily Bazelon, staff writer. Eric Posner, Law Professor at the University of Chicago. [The Government Gorsuch Wants to Undo, 4-1-17, https://www.nytimes.com/2017/04/01/sunday-review/the-government-gorsuch-wants-to-undo.html]

The 80 years of law that are at stake began with the New Deal. President Franklin D. Roosevelt believed that the Great Depression was caused in part by ruinous competition among companies. In 1933, Congress passed the National Industrial Recovery Act, which allowed the president to approve “fair competition” standards for different trades and industries. The next year, Roosevelt approved a code for the poultry industry, which, among other things, set a minimum wage and maximum hours for workers, and hygiene requirements for slaughterhouses. Such basic workplace protections and constraints on the free market are now taken for granted. But in 1935, after a New York City slaughterhouse operator was convicted of violating the poultry code, the Supreme Court called into question the whole approach of the New Deal, by holding that the N.I.R.A. was an “unconstitutional delegation by Congress of a legislative power.” Only Congress can create rules like the poultry code, the justices said. Because Congress did not define “fair competition,” leaving the rule-making to the president, the N.I.R.A. violated the Constitution’s separation of powers. The court’s ruling in Schechter Poultry Corp. v. the United States, along with another case decided the same year, are the only instances in which the Supreme Court has ever struck down a federal statute based on this rationale, known as the “nondelegation doctrine.” Schechter Poultry’s stand against executive-branch rule-making proved to be a legal dead end, and for good reason. As the court has recognized over and over, before and since 1935, Congress is a cumbersome body that moves slowly in the best of times, while the economy is an incredibly dynamic system. For the sake of business as well as labor, the updating of regulations can’t wait for Congress to give highly specific and detailed directions. The New Deal filled the gap by giving policy-making authority to agencies, including the Securities and Exchange Commission, which protects investors, and the National Labor Relations Board, which oversees collective bargaining between unions and employers. Later came other agencies, including the Environmental Protection Agency, the Occupational Safety and Health Administration (which regulates workplace safety) and the Department of Homeland Security. Still other agencies regulate the broadcast spectrum, keep the national parks open, help farmers and assist Americans who are overseas. Administrative agencies coordinated the response to Sept. 11, kept the Ebola outbreak in check and were instrumental to ending the last financial crisis. They regulate the safety of food, drugs, airplanes and nuclear power plants. The administrative state isn’t optional in our complex society. It’s indispensable.

#### Strong administrative state checks economic inequality

Rahman 18 – Associate Professor of Law, Brooklyn Law School  
Sabeel Rahman, Visiting Professor of Law at Harvard and Fellow at the Roosevelt Institute, Reconstructing the Administrative State in an Era of Economic and Democratic Crisis, 131 Harv. L. Rev. 1671, April 2018,

The **rise of the administrative state** was thus not a politically neutral endeavor. The checks and balances that legitimate administrative authority in essence make possible (but do not guarantee) the contestation of deep forms of economic and social inequality, subordination, or hierarchy**.** This is not to say that administrative authority is always equality or inclusion promoting — hardly. But in a reality where background economic, social, and historical conditions already encode structural disparities of wealth, opportunity, power, and influence, eliminating regulatory agencies and tools that are potentially capable of addressing these disparities (even if they are not always deployed in these ways) precludes much of **equality- or inclusion-promoting public polic**y from getting off the ground in the first place. The dismantling of administrative institutions, then, is similarly nonneutral. Scholars of the administrative process have long warned of the dangers of special interest capture of regulatory agencies, which would cause administrative authority to be **redirected to serve some interests over others**. But agencies can also be captured and neutered through *inaction* — through what political scientists call “drift,” where highly resourced and sophisticated players are able to produce substantive policy change simply by holding existing rules in place in the face of changing external conditions.Dismantling agencies altogether would be an even more extreme form of opposition to these potential uses: rather than trying to capture or simply neuter the agency, more radical efforts to deconstruct regulatory institutions cut off the very possibility by **eliminating** the **regulatory capacity** itself, a kind of complete and total capture through deconstruction. This substantive valence of administrative power and its potential deconstruction adds an important layer to Michaels’s critique of privatization. Michaels alludes to the ways in which privatization risks permanently dismantling institutional tools and capacities that are difficult to rebuild. As Michaels warns, **under privatization,** “we will have hollowed out the government sector to such an extent that we may well lack **the** capacity, infrastructure, **and** know-how to **reclaim** that which has increasingly been outsourced or marketized” (p. 12). He rightly notes that privatization emerged as a “pivot[]” strategy in the Reagan era, a “second-best” to dismantling regulatory bodies themselves (p. 97). This is a problem in particular because “the Market, at least in its pure, idealized state, **is not democratic, deliberative, or juridical**. . . . It is the world of Schumpeter and Coase, not Montesquieu or Madison” (p. 5). Private corporate governance, meanwhile, cannot replicate the kinds of checks and balances that the separation of powers principles require (p. 164). **Dismantling** administration and returning to private ordering is therefore **troubling for democracy in three senses**. First, given prior background structural patterns of exclusion and disparities of wealth, power, and opportunity, a return to private economic and social ordering is by definition a return to economic inequality, social hierarchy, and exclusion. Second, the dynamics of market competition or of **corporate governance cannot replicate or replace** public **institutions** of **democracy or of checks and balances**. They operate fundamentally differently and are not substitutes. Third, a dismantling of regulatory institutions removes some of the most **vital and effective mechanisms** through which we as a **democratic public seek to contest and reshape** these background structural inequities and exclusions: **without** tools of general administrative **policymaking and enforcement**, these structural inequities are **harder to overcome and reshape**.

#### Economic inequality causes social collapse and extinction

Brown, 14

([Alex Brown](https://www.theatlantic.com/author/alex-brown/) is a Congressional correspondent at National Journal. "Here's How NASA Thinks Society Will Collapse," March 18 2014 <https://www.theatlantic.com/politics/archive/2014/03/heres-how-nasa-thinks-society-will-collapse/441375/> NL)

Few think Western civilization is on the brink of collapse — but it's also doubtful the Romans and Mesopotamians saw their own demise coming either. If we're to avoid their fate, we'll need policies to reduce economic inequality and preserve natural resources, according to a NASA-funded study that looked at the collapses of previous societies. "Two important features seem to appear across societies that have collapsed," reads the study. "The stretching of resources due to the strain placed on the ecological carrying capacity and the economic stratification of society into Elites and Masses." In unequal societies, researchers said, "collapse is difficult to avoid.... Elites grow and consume too much, resulting in a famine among Commoners that eventually causes the collapse of society." As limited resources plague the working class, the wealthy, insulated from the problem, "continue consuming unequally" and exacerbate the issue, the study said. Meanwhile, resources continue to be used up, even by the technologies designed to preserve them. For instance, "an increase in vehicle fuel efficiency technology tends to enable increased per capita vehicle miles driven, heavier cars, and higher average speeds, which then negate the gains from the increased fuel-efficiency," the study said. The researchers used what they termed a Human And Nature DYnamical (HANDY) formula to reach their conclusions. The formula uses factors such as birth rates, resources, and income classes to create a mathematical equation to project outcomes. The study was sponsored by NASA's Goddard Space Flight Center and headed by the National Science Foundation's Safa Motesharrei. For those who think modern society is immune from the problems that brought down ancient civilizations, a "brief overview of collapses demonstrates not only the ubiquity of the phenomenon, but also the extent to which advanced, complex and powerful societies are susceptible to collapse," the study said. So how do we save ourselves? "Collapse can be avoided, and population can reach a steady state at the maximum carrying capacity, if the rate of depletion of nature is reduced to a sustainable level, and if resources are distributed equitably," reads the report.

#### The United States federal government should expand the scope of the Sherman Act to give the Department of Justice exclusive authority over antitrust law.

### Adv 2 is Turf Wars

#### Dividing regulatory authority between the DOJ and the FTC is awful for both agencies—

#### First is the DOJ--

#### The division of power ruins the DOJ’s foreign policy signaling and radically weakens national security—the FTC consistently rules against the US’ best interests, which guarantees we lose the tech race to China and causes Huawei to gain an international foothold

McGinnis and Sun 21, John O. McGinnis is the George C. Dix Professor in Constitutional Law at Northwestern Pritzker School of Law. McGinnis is a panelist called on to decide WTO disputes and graduate of Harvard Law School, Linda Sun is an intellectual property lawyer at Wilmerhale and former editor in chief of Northwestern Journal of Technology and Intellectual Property during her time at Northwestern Pritzker School of Law, “Unifying Antitrust Enforcement for the Digital Age”, 78 Wash. & Lee L. Rev. 305, 2021

ANTITRUST ENFORCEMENT SHOULD BE CONSOLIDATED WITHIN THE DEPARTMENT OF JUSTICE

With the understanding that dual enforcement cannot continue, this Part explains why antitrust enforcement is best placed under the DOJ's Antitrust Division. We first show that the DOJ, not the FTC, should be the choice because antitrust now has serious foreign policy and national security ramifications in our technological era that must be handled by an agency directly responsible to the president, who controls the numerous other mechanisms for dealing with such issues. 247 We next show that removing the FTC from antitrust will have the substantial added advantage of improving its oversight of privacy-a consumer protection matter also given new prominence by technology.

A. Antitrust Policy Increasingly Implicates Foreign Policy

Antitrust law has always affected foreign policy. That much is evident in the various international antitrust organizations and agreements in existence. 248 Enforcement decisions, even those involving only domestic companies, have political and economic ramifications for the United States internationally. 249

However, antitrust law plays a particularly important role in international politics today due to the rise of technology. Technology has revolutionized foreign intelligence and espionage. 2 50 Accordingly, countries have grappled for control of the technology industry, notably China and the United States, 251 initiating "the technology cold war." 252 Both the United States and China have used antitrust regulation to further their position in this technology war. 253 Therefore, technological advancement requires that antitrust enforcement be carefully coordinated with foreign policy.

The executive branch, specifically the president, directs and controls relations with international entities. 254 Thomas Jefferson described the president as "the only channel of communication between the United States and foreign nations." 255 Traditional descriptions of executive power by political writers have necessarily included foreign affairs powers. 256 The Constitution specifically enumerates the president's power to make treaties, appoint ambassadors, and control the army and navy. 257 These designations enable the president to conduct diplomacy with foreign nations. 258 The Supreme Court has affirmed that the president is "the sole organ of the federal government in the field of international relations." 259 The secretary of state, the Foreign Service, and the U.S. Agency for International Development report to the president and carry out his or her foreign policy.2 0 Outside of constitutional grants of power, as a practical matter, the president is generally privy to information relevant to foreign affairs on a more up-to-date basis than other governmental bodies.26 1 His or her constitutional power and comparative information advantage both place the president in a position to direct international relations and safeguard against foreign threats. Therefore, the president must directly oversee antitrust policy to carry out his or her constitutional foreign policy duties.

The president has such direct oversight of the DOJ. The president appoints the attorney general and assistant attorneys general 262 and retains the power to fire these agents at will. 26 3 The Antitrust Division has a particularly hierarchal structure wherein the president appoints an assistant attorney general who oversees the entire Antitrust Division. 2 64 The same cannot be said for the FTC. The FTC is an independent agency, and heads of the agency can only be removed by the president for good cause. 2 65 The president may exert political pressure on the FTC as an independent agency to take a specific action, but he is not able to direct the agency in the same way. 266 And, since the Supreme Court upheld the constitutionality of the independence of the FTC, 267 the president has never fired any commissioner. 268

Under dual antitrust enforcement, the president is thus ~~handicapped~~ [constrained] in his or her direction of antitrust policy. The FTC and DOJ jointly represent the United States in multiple international antitrust organizations, such as the Internal Competition Network269 and Competition Committee of the Organization for Economic Cooperation and Development. 270 The FTC has the power to enforce its antitrust judgments abroad,271 which further hinders the president's ability to form cohesive international policies. Further, the FTC does not distinguish between its international and domestic activities. 272 After the agency determines its enforcement policies, it "enforces them to the fullest extent of its jurisdictional authority, whether foreign or domestic."273 This could give rise to antitrust decisions that cut against the nation's best interest. Antitrust policy is a tool in the toolbox when it comes to navigating a complex global economy and political landscape. It should be used in the context of the country's overall international policies and goals.

FTC v. Qualcomm reveals how international relations and national security are intertwined with antitrust policy. 274 Opposing the district court's decision in the case successfully brought by the FTC, the DOJ argued that the antitrust enforcement action harmed Qualcomm's ability to compete and so posed a serious national security threat.275 As support, the agency cited to statements by the Departments of Defense and Energy. 276 Through various departments, the executive branch has taken strong steps to protect Qualcomm amidst the technology cold war between the United States and China. This suit threatened to do the opposite.

Qualcomm is the world's largest manufacturer of smartphone chips. 277 It is also the only American company that manufactures such chips, with China-backed Huawei as one of its biggest competitors. 278 These two companies are at the heart of a battle between the United States and China for technological dominance. 279 Qualcomm and Huawei are central to the development of 5G, the new standard network for mobile devices. 280 The outcome of the 5G race will determine whether the U.S. will continue to dominate the technology industry, or if it will "cede that control to China, which sees technological dominance as a way to become a world superpower." 281 National security experts worry that if Huawei dominates the 5G market, it could use its networks for espionage or shut down critical communications. 282 Many lawmakers have also expressed concern with China's rise in technology, fearing a Chinese surveillance state.283

In addressing these threats, President Trump blocked an attempted acquisition of Qualcomm by Broadcom in 2018.284 The president expressed concern that Broadcom, a Singaporean company, would cut off Qualcomm's R&D and enable Huawei to dominate the marketplace. 285 The transaction was blocked through the Committee on Foreign Investment in the United States (CFIUS), a committee comprised of executive branch officers such as the secretaries of the Treasury, Justice, Homeland Security, Commerce, and Defense-all directly responsible to the president.286 CFIUS reviews economic transactions by foreign entities and advises the president, who can block transactions that threaten national security. 287 CFIUS reviews have increased steadily in the last decade and Chinese transactions have accounted for the majority of the investigations.288

Outside of CFIUS, the executive branch imposed restrictions on Huawei and affiliated companies. In 2019, the U.S. Commerce Department placed Huawei on a trade blacklist based on national security concerns. 289 In announcing the action, the secretary of commerce cited a presidential directive ordering the department to be vigilant in protecting national security activities. 290 In 2020, the DOJ indicted Huawei for intellectual property theft and conspiring to steal trade secrets. 291 The international importance of the U.S. actions is underscored by its joining a movement of democracies to isolate Huawei and promote other companies as 5G providers. 292

China has also taken counteractions against U.S. technology, making any mechanism the United States has in this struggle more important. In 2018, Chinese antitrust regulators blocked Qualcomm from acquiring rival chipmaker NXP. 293 The Trump administration had lobbied the Chinese government to approve the deal, which would have allowed Qualcomm to expand into new market areas. 294 In 2019, the Chinese government ordered Chinese public institutions to replace foreign software and computer equipment with domestic suppliers within a few years. 295 In sum, both China and the U.S. have leveraged antitrust regulation to give domestic companies a strategic international competitive advantage. And this technology war is only one part of a broader strained trade relationship between the United States and China.296 The White House has reported that China's market-distorting policies and economic aggression pose a threat to the global economy.297 A 2018 report pointed to state-sponsored IP theft through cyber espionage and forced technology transfer regulations. 298 Since 2018, the two countries have had to negotiate various tariffs and trade agreements. 299

Therefore, it is highly anomalous that the FTC has exercised its prosecutorial discretion to bring an antitrust action against Qualcomm that will-in coordination with China's actions-directly benefit Huawei and aid China in its foreign policy goals, when the president and his advisors are actively pursuing exactly the opposite goal. The problem created by the struggle for technological dominance and antitrust's role in it goes beyond this single case, important as it is. As of 2018, China had nine of the world's top twenty technology companies.300 Big Tech executives have argued that breaking up Big Tech under antitrust law will only help Chinese companies dominate the industry.301 Effectively, they promote a "national champion" view: the nation needs powerful, dominant companies lest a foreign company take the helm. 30 2 Some scholars have criticized national champion policies, stating that any short-term advantages are outweighed by the harm to national innovation. 303 Regardless, the battle over the future of technology shows how antitrust regulation plays a key role in a struggle for technological, economic, and political power-and that the U.S. needs a single, president-coordinated agency to guide the process.

The problem of integrating antitrust with the rest of foreign policy is not unique to China or President Trump. President Barack Obama, like President Trump, accused the EU of pursuing antitrust or regulatory actions against Big Tech in order to help their own tech companies compete.30 4 Some countries in the EU are using state authority to promote national champions to combat U.S. tech dominance.305 For instance, France and Germany have spent significant government resources in attempts to create a European rival to U.S, cloud computing companies.306 France has additionally levied a tax on digital giants, commonly dubbed "GAFA," because it will primarily affect American tech companies Google, Apple, Facebook, and Amazon.30 7 U.S. antitrust regulators must also counter these threats to the American economy and technological dominance when exercising prosecutorial discretion over enforcement actions in the technological arena.

The competition for technological dominance is an enduring fact of our age. Moreover, technology is encompassing more and more important industries, encapsulated in the saying that "software is eating the world."308 It is thus more important today for the nation's antitrust policy to be aligned with other foreign policy actions taken by the executive branch.309 The FTC should not be able to bring antitrust actions when they can cut against the various other international efforts taken by the country.

#### That’s key to prevent Great Power War via tech leadership with China

LSE 21, London School Of Economics and Political Science, 1/28/2021, "The West needs to respond to China's bid for technology dominance: New report," London School of Economics and Political Science, https://www.lse.ac.uk/News/Latest-news-from-LSE/2021/a-Jan-21/The-West-needs-to-respond-to-Chinas-bid-for-technology-dominance-New-report

The authors also argue more needs to be done to protect and control access to Western technologies and reduce dependency on certain Chinese innovations (such as Huawei’s 5G), as well as ensuring such dependency does not recur in the future, for example with advancements in Artificial Intelligence.

The report notes the West still outperforms China in most areas of advanced technology. However, it needs to build upon institutions (eg: legal and trade organisations) that underly and contribute to technological success; prioritise technological innovation in the long-term; strengthen labour forces; and learn from China’s industrial policy, for example in long-term finance and planning.

Commenting on the report, Christopher Coker, Director at LSE IDEAS said: “The desire of states to preserve their information sovereignty is becoming a major policy issue in what is threatening to become a new Cold War. Two sharply defined technological and online systems are emerging which may well govern the future development of AI, big data, quantum computing and 5G and quite possibly determine the future shape of cyber conflict from espionage to warfare.

“Without a common strategy on technology the relationship between western states and China may become increasingly transactional, in the process diminishing their overall security and threatening their digital sovereignty. This report explains the dangers of this happening and advances concrete policy prescriptions to avoid it. Unless countries feel secure, they are unlikely to avoid making the mistakes that in the past too often ended in great power conflict.

#### The “Huawei model” is exported to allow a Chinese foothold in US infrastructure development and cyber conflict via built in “kill switches”

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The central security concern rests upon a theoretical proposition that Chinese technology underpinning international communications systems could be weaponised by the Chinese state. The US and its allies, amongst others, distrust the authoritarian Chinese party state and fear its growing technological and military capabilities. Despite being a private firm, observers note Huawei could be co-opted to serve the national security objectives of the Chinese government and forced to facilitate espionage or cyber-attacks (Gilding, 2020). Article 7 of China’s National Intelligence Law of 2017 is particularly cited, which requires that Chinese firms and their employees cooperate with national intelligence agencies lawfully carrying out their work (Girard, 2019). The US government has equivalent powers (Eisenstein & Halpert, 2018).

The risk of espionage would appear on the face of it to be realistic. After all, it is well documented, including in the Snowden and WikiLeaks revelations, that the US and its Five Eyes (Australia, Canada, United Kingdom and New Zealand) partners similarly engage in espionage (Snowden, 2019), including co-opting Apple, Facebook, Google and other firms to collect data (Biddle, 2020). There is no reason to believe China is not doing the same, regardless of the geopolitical climate and regardless of standard government denials. The perennial risks of espionage raise highly technical questions about capabilities of detection and protection. These are relevant questions not only in relation to Huawei, but for all telecommunications systems and the complex global supply chains for equipment and software.

The risk of cyber-sabotage is much more dependent on the state of the geopolitical climate. In a state of contest, confrontation and potential conflict, there is a risk that technically undetectable malicious code or “kill switches” are implanted into 5G networks, which could be used for cyber-attacks on critical infrastructure. Such aggressive actions might have been less likely during previous years when the US and China and other countries were cooperatively engaged in building interdependent economies. Indeed, Huawei has been intent on building its international reputation as a trusted provider of state-of-the-art technology and it would appear to be self-defeating to allow itself to be used as a platform for hostility against its customers. In the new era of geopolitical competition however, featuring new flashpoints of confrontation, economic decoupling and more aggressive positioning by both the US and China, the risks become more likely that firms such as Huawei (or indeed firms on the US side) might be co-opted or compromised for more aggressive security operations. This is not a risk specific to the firm, but a risk of hostile state action.

Looking forward, the security of 5G networks will become even more important for the connected technologies of the future. Indeed, risks will not only be generated by major power geopolitical contest but governments will also need to protect against cyber-attack from other states, terrorist organisations or rogue individuals. Whether Huawei can be enlisted as a partner in protecting against such risks, or whether it is a vector of risk, will depend upon normative perspective. Further, countries along the so-called digital silk road that are cooperating with Huawei to build “smart city” infrastructure may see more opportunities than risks, while observers from liberal democracies will be concerned about how such infrastructure might in turn be used for surveillance and social control. Whether China is exporting authoritarianism along its digital silk road rests upon the question of agency. How safe city or other programs are deployed by host governments is, at the end of the day, a matter for them rather than China (Weiss, 2019). After all, US, European and Japanese firms also export facial recognition technology that could be used to target groups or individuals but are not accused of exporting authoritarianism. This underlines the normative bias that runs through most of the narratives about Huawei.

International relations risk

The Huawei case exposes a critical gap in global governance. Inadequate rules, norms, standards and institutions exist to manage risks of globally interconnected technology. The international community is ill-prepared for the implications of the so-called “fourth industrial revolution” of big data, artificial intelligence and an internet of things, composed of connected devices and networks. The digital economy has emerged at a time of unipolarity in the international system and a weakening commitment from the US, as the dominant power, towards multilateralism. In the early stages of the digital economy, US firms such as Facebook and Google wielded significant, largely unregulated power. While the internet evolved with some private sector oversight of certain rules (such as domain names), it had no agreed set of international norms or standards and certainly no international enforcement. In the absence of rules, norms, standards and institutional enforcement, technologies generating risks have developed ahead of technical capabilities to manage those risks. Indeed, technical experts claim the complexity of telecommunications technology renders it impossible to guarantee against malicious code or backdoors in equipment (Lysne, 2018; Chang, 2020). Nevertheless, the risk of malicious action has not prevented the international community from developing – and abiding by – rules, norms, standards and institutions in numerous areas of strategic importance, from food safety to aviation. The lack of discussion about governance options for emerging technologies is therefore remarkable.

Governance of 5G telecommunications has become embroiled in the US-China geopolitical contest, as has governance of the internet. The US has opposed any expansion of the mandate of the International Telecommunications Union (ITU), one of the oldest international organisations, to govern digital communications. Meanwhile China, has developed a clear ambition to be rule-setter and norm maker in internet governance and cyber sovereignty (Schia & Gjesvik, 2017; Wang, 2020), as well as in other transformational technologies such as blockchain and its applications in finance, manufacturing, transport, food safety and public security (Cai, 2019; Stockton, 2020). Across its “digital silk road” partnerships with developing nations, China has promoted uniform standards for 5G rollout (consistent with those set by the ITU), as well as for artificial intelligence and satellite navigation systems (Chan, 2019). China will likely wield influence amongst its technological partners in the rules, norms and standards that will develop over time. China – together with firms such as Huawei - has been actively promoting its cyber governance model at World Internet Conferences, the ITU, the International Standardisation Organisation and the International Electrotechnical Commission and the two United Nations (UN) working groups, the Group of Governmental Experts and the Open-Ended Working Group. China can be expected to have the support of a significant number of developing countries.

While the US has begun to participate more actively in these forums in recent times, a fundamental clash of world views makes it unlikely consensus can be achieved. The Chinese government’s aims in cyber governance include maintenance of social stability and protection from foreign influence, deemed to require control of domestic information that is perceived as a threat to the regime. Consistent with its combination of Confucian cultural roots and Marxist-Leninist political ideology, the Chinese party states rules “by law”, in contrast with the liberal Western notions, “rule of law” and contested power. China’s approach to cyber governance is therefore focused on the state’s ability to control content, which includes network security, while Western approaches are focused on network security and not content. China proposes global standards for data security, while the US is moving to establish its so-called “Clean Network” to set standards amongst a set of “trusted” partners, which appears to ignore the global interconnectedness of supply chains and in particular data, with the emergence of cloud technologies and electronic commerce that rely upon free flow of data. China and the US also take opposing positions on governance of cyber-warfare capabilities, with China supporting (publicly at least) a UN-supervised ban, while the US prefers the status quo in which it can continue to develop its capabilities (McCarthy, 2019).

The Huawei paradox, combined with the politics of fear and blame during the Covid-19 pandemic of 2020, has amplified the different approaches of the US, with its lack of a governance framework for data security and opposition to multilateral solutions, and China, with its Cyber Security Law and support for global cyber governance. It appears the law of the cyber jungle will persist at the global level while, as will be discussed below, the European Union (EU), with its comprehensive Cybersecurity Act, General Data Protection Regulation (GDPR) and Directive on Security of Network and Information Systems (NIS), models at a regional level the most advanced attempt at rules, norms and standards to guide cyber risk management.

Economic cooperation risk

The denial of supply of advanced semiconductor chips to Huawei by the US appears likely to reinforce China’s geopolitical fears of containment and indeed historic memories of dismemberment by outside powers. Consequently, it can be expected to drive China to double down on its strategy for not only self-reliance and alternative sources of supply but indeed dominance in next generation technologies. It may take some years, but China can be expected to develop a semiconductor industry to rival the US in time. While it is impossible to prove a counterfactual, it has been suggested by Kennedy (2020) that a more “principled interdependence” between US and Chinese supply chains rather than decoupling might have sustained US semiconductor leadership, slowed China’s technological advance and offered opportunities for joint work on risk management. Coercion has been chosen over cooperation in what may yet prove to be a turning point in the deteriorating geopolitical contest between the US and China, which was being extended to impact new firms and new industries at the time of writing.

The economic costs of excluding Huawei alone are considerable. A Huawei-commissioned Oxford Economics report (2019) predicted that restricting Huawei from competitive tenders will lead to increased 5G investment costs of between eight percent to 29 percent over a decade and would have a cost to GDP in 2035 from $2.8 billion in Australia to $21.9 billion in the US. For US semiconductor firms, the export controls on sales to Chinese buyers constitute a major risk to their global business strategies. In a survey of exports in the first four months of 2018, Capri (2018) found Qualcomm relied on China for 60 percent of revenue, Micron over 50 percent and Broadcom about 45 percent. A Boston Consulting Group report forecast a full decoupling with China would reduce the US chip sector revenue by 37 percent and lower its market share to 30 percent, while China’s market share would rise from three percent to 31 per cent (Varas & Varadarajan, 2020). Further, as the geopolitical climate worsens, there is a risk that China will retaliate against US or allied firms. The Chinese government has reportedly drawn up plans to target so-called “unreliable entities”, such as Fedex, which it is alleged allowed shipments of weapons to Hong Kong and mainland China and diverted US packages addressed to Huawei (Wu, 2020). Any tit-for-tat economic coercion between China and the US will pose significant economic risks for third parties if it escalates, as expected, to include more expansive export controls, prosecutions of technology theft and restrictions on joint research and development with Chinese partners (Thomas-Noone, 2020).

Farrell & Newman (2019) coined the phrases “weaponised interdependence” for this phenomenon of a state deploying economic coercion to leverage its asymmetrical power over a global network and “chokepoint effect” to deny network access to an adversary. Now that the US has set the precedent in its campaign against Huawei, how else the tactic might be deployed is not yet clear, with fears in China, for example, that the US could target international payments through its SWIFT system (Zhao, 2020). To be sure, once the process is initiated against a firm or a sector, entire supply chains will be disrupted. The consequent evolution of a new global economy that moves away from market-led globalisation towards state-led spheres of geopolitical influence is uncertain at this point but 2020 may yet turn out to be a tipping point towards a much more geopolitically-infused international business environment. Geopolitical risk analysis is likely to receive much more attention in international business literature.

Risk assessment

The assessment of security, international relations and economic cooperation risks for 5G networks must be made in the context of not only contemporary international relations but over the life of such networks. This means planning for scenarios, including worst case scenarios. The theoretical capability for cyber-attack, for example, might not be a serious risk in some scenarios, but might become a threat in worst case scenarios in which the major powers are escalating confrontation or engaged in conflict. Following his Huawei ban, Australian prime minister, Malcolm Turnbull observed “it’s important to remember that the threat is a combination of capability and intent. Capability can take years or decades to develop … but intent can change in a heartbeat” (Bourke, 2019). The Australian government clearly assessed the risk could become a threat, and therefore adopted a strategy of risk avoidance by banning Huawei all together. Based on distrust of the Chinese party state, the logic of this strategy would be to avoid all critical supply dependencies on China, which has indeed become a common rallying call within the US and some of its allies since.

Any qualitative assessment of risks must take into account two key concepts, likelihood and consequence. The type of political risk will depend on whether the factors generating the risk arise at the firm level, the country level or as a result of the geopolitical environment. Huawei as a firm has been assessed to pose security risks because of the nature of the Chinese party state and the risks are therefore China risks, or geopolitical risks, rather than specific to the firm itself. Equally, the international relations risks that are generated by the case appear to be not simply because of Huawei itself but arise from the diverging interests of the US and China, characterised in particular by the lack of global governance rules, norms, standards and institutions, which have been established and maintained in other sectors, as noted above, from aviation to food security. Further, in relation to economic cooperation risks, Huawei again appears to be simply the trigger case for an emerging trend in the new geopolitical contest for the US and China to deploy economic coercion, to reconfigure supply chains and indeed to reshape globalisation according to geopolitical agendas and, consequently, abandoning the neoliberal and internationalist market-led phase of globalisation that characterised previous decades.

Accordingly, the Huawei case can be assessed as a prime example of geopolitical risk and can therefore only be understood in the context of the international relations, security and consequent economic policies of the major powers. Suppliers and partners of Huawei and indeed any strategically important firms from China or the US must therefore plan to manage geopolitical risks in the current environment. There has traditionally been very little cross-fertilisation between business literature on political risk and international relations literature (Fägersten, 2015), yet this discussion demonstrates that risks for governments, firms and communities in the Huawei case are entirely bound up in questions of international relations and will require new approaches to risk management.

#### **Cyber conflict over infrastructure guarantees extinction**

Pamlin and Armstrong ’15 [Dennis and Stuart; February 2015; Executive Project Manager at the Global Challenges Foundation; James Martin Research Fellow at the Future of Humanity Institute and in the Oxford Martin School at the University of Oxford; Global Challenges Foundation, “12 Risks that threaten human civilization,” <https://www.pamlin.net/material/2017/10/10/without-us-progress-still-possible-article-in-china-daily-m9hnk>]

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3.1 Current risks

3.1.5 Global System Collapse

Global system collapse is defined here as either an economic or societal collapse on the global scale. There is no precise definition of a system collapse. The term has been used to describe a broad range of bad economic conditions, ranging from a severe, prolonged depression with high bankruptcy rates and high unemployment, to a breakdown in normal commerce caused by hyperinflation, or even an economically-caused sharp increase in the death rate and perhaps even a decline in population. 310

Often economic collapse is accompanied by social chaos, civil unrest and sometimes a breakdown of law and order. Societal collapse usually refers to the fall or disintegration of human societies, often along with their life support systems. It broadly includes both quite abrupt societal failures typified by collapses, and more extended gradual declines of superpowers. Here only the former is included.

3.1.5.1 Expected impact

The world economic and political system is made up of many actors with many objectives and many links between them. Such intricate, interconnected systems are subject to unexpected system-wide failures due to the structure of the network311 – even if each component of the network is reliable. This gives rise to systemic risk: systemic risk occurs when parts that individually may function well become vulnerable when connected as a system to a self-reinforcing joint risk that can spread from part to part (contagion), potentially affecting the entire system and possibly spilling over to related outside systems.312 Such effects have been observed in such diverse areas as ecology,313 finance314 and critical infrastructure315 (such as power grids). They are characterised by the possibility that a small internal or external disruption could cause a highly non-linear effect,316 including a cascading failure that infects the whole system,317 as in the 2008-2009 financial crisis.

The possibility of collapse becomes more acute when several independent networks depend on each other, as is increasingly the case (water supply, transport, fuel and power stations are strongly coupled, for instance).318 This dependence links social and technological systems as well.319

This trend is likely to be intensified by continuing globalisation,320 while global governance and regulatory mechanisms seem inadequate to address the issue.321 This is possibly because the tension between resilience and efficiency 322 can even exacerbate the problem.323

Many triggers could start such a failure cascade, such as the infrastructure damage wrought by a coronal mass ejection,324 an ongoing cyber conflict, or a milder form of some of the risks presented in the rest of the paper. Indeed the main risk factor with global systems collapse is as something which may exacerbate some of the other risks in this paper, or as a trigger. But a simple global systems collapse still poses risks on its own. The productivity of modern societies is largely dependent on the careful matching of different types of capital 325 (social, technological, natural...) with each other. If this matching is disrupted, this could trigger a “social collapse” far out of proportion to the initial disruption.326 States and institutions have collapsed in the past for seemingly minor systemic reasons. 327 And institutional collapses can create knock-on effects, such as the descent of formerly prosperous states to much more impoverished and destabilising entities.328 Such processes could trigger damage on a large scale if they weaken global political and economic systems to such an extent that secondary effects (such as conflict or starvation) could cause great death and suffering.

#### Second is the FTC—

#### Splits within the FTC over antitrust authority tanks effective privacy regulation---and the plan solves it

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Eliminating its jurisdiction over antitrust will also give the FTC the resources and focus to address issues of privacy. Privacy law has grown in prominence along with the rise of digital technology.310 While most Western countries have comprehensive privacy protections, the U.S. has taken a piecemeal approach, with various sector-specific and state-specific laws.311 These uneven regulations have been criticized for causing confusion for businesses and failing to adequately protect consumers. 312 In fact, 79 percent of Americans are concerned about the way their data is being used by companies and most feel that they have little to no control over how their personal data is used.313

First, eliminating FTC antitrust jurisdiction would free up resources, enabling the agency to dedicate more of its funding, personnel, and time to privacy issues.314 Second, it would streamline the FTC's mission, which is currently divided between dueling goals of consumer protection and antitrust.315 Agencies tend to perform better when they have a cohesive mission.31 6 Removing the agency's antitrust duties would resolve this problem. Narrowing the focus of the FTC's responsibilities would be a significant step in the right direction for the agency and the future of privacy law.

The FTC needs more resources to adequately address the nation's growing privacy concerns. 3 17 Currently, the FTC oversees both consumer protection-encompassing privacy-and antitrust, 318 making the FTC the chief federal agency on privacy policy and enforcement 319 and the nation's de facto privacy agency. 320 The agency has long-standing experience in enforcing privacy statutes 321 and also has special privacy assets, such as an internet lab capable of high-quality tech forensics to track invasions of privacy. 322 The FTC, however, has failed to keep pace with the massive growth of privacy concerns-a phenomenon also driven by modern technology. 323 Very few Americans feel confident in the privacy of their information in the digital age. 324 According to a 2019 study, over 80 percent of Americans feel that they have little to no control over the data collected on them by companies and the government. 325 To adequately address privacy concerns, the FTC needs more resources. 32 The agency has been explicit that it needs more manpower to police tech companies. 32 7 In requesting increased funding from Congress, FTC Director Joseph Simons said the money would allow the agency to hire additional staff and bring more privacy cases. 328 A former director of the FTC's Bureau of Consumer Protection, which houses the privacy unit, has called the FTC "woefully understaffed." 329

As of the spring of 2019, the FTC had only forty employees dedicated to privacy and data security, compared to 500 and 110 employees at comparable agencies in the U.K. and Ireland, respectively. 330 Without more lawyers, investigators, and technologists, the FTC will be forced to conduct privacy investigations less thoroughly, and in some cases, forgo them altogether. 331 Currently, the FTC's resources are spread thin across multiple missions, to the detriment of its privacy efforts.

Removing the agency's antitrust responsibilities would reallocate resources from the antitrust department to its privacy unit and other areas of consumer protection. 332 Further, it would free up the scarce time of the commissioners to oversee this essential effort. 333 This reallocation of resources is especially timely because the FTC's privacy responsibilities are expected to grow in the future. The FTC is already on its way to becoming a consumer protection agency primarily focused on privacy. 334 In its 2019 budget request to Congress, over half of the agency's budget was allocated to privacy. 335 In addition, lawmakers on both sides of the political spectrum have proposed federal privacy legislation. 336 Such legislation would expand the FTC's jurisdiction, empower it to bring more privacy actions, and increase the demands on its privacy resources. 337 Right now, the U.S. is one of the only Western countries that does not have a comprehensive federal privacy law.338 Public pressure is great from both industry and scholars to change that, which would lead to increased privacy action at the federal level. 339 Moving the FTC's antitrust duties to the DOJ would cleanly complete a readjusting of priorities that is already happening organically.

Removing its authority over competition law would also provide the FTC with organizational clarity. Currently, the agency serves dual missions of antitrust and consumer protection. Originally, the FTC only had antitrust jurisdiction: the FTC Act banned "unfair methods of competition in or affecting commerce." 340 In 1931, the Supreme Court held that his did not include consumer protection. 341 In 1938, Congress passed the Wheeler-Lea Act, 342 which amended the FTC Act to cover "unfair or deceptive acts or practices." 343 This paved the way for the FTC's modern consumer protection mission. 344 Since then, the agency has had to pursue goals that are sometimes in conflict.

Consumer protection laws prevent companies from misleading or cheating customers. Viewed broadly, consumer protection encompasses a paternalistic social goal of protecting consumers from themselves. 345 Consumers may not wish to be educated on manipulative practices or dangerous products, but consumer protection laws aim to protect consumers despite any preference for ignorance. The FTC enforces numerous consumer protection statutes that govern bankruptcy abuse, scholarship fraud, tobacco education, and credit card accountability, among other things. 346

The FTC approaches privacy as a consumer protection issue. 34 7 Accordingly, the FTC promotes privacy interests through its Bureau of Consumer Protection. 348 At first, the agency pursued a limited deception-based approach to privacy by targeting companies that did not comply with their own privacy policies. 34 9 Since then, the FTC has broadened its approach to a harms-based inquiry against unfair handling of consumer data.350 The harms are generally linked to the rise of digital technology. For instance, consumers cannot effectively protect themselves in our dynamic, information-intense environment. 351 Some argue that digital products have led to externalities such as reduced offline interaction, addiction by design, and environmental harm in the form of electronic garbage and energy consumption. 352 Competition will result in the amount of privacy demanded by the market, which may not account for externalities and inaccurately reflect society's desires compared to the amount of privacy that people would collectively choose through legislation.353

In contrast to consumer protection law, antitrust law aims to preserve "free and unfettered competition." 354 The foundation of antitrust law is now understood to be protecting consumer welfare that flows from economic efficiency. 355 Antitrust promotes the free market by outlawing monopolization and unreasonable restraints of trade.356 Rather than the social goals of privacy and protection from deception promoted by consumer protection, antitrust pursues economic efficiency. 357

Consumer protection and free competition can work against each other. Consumer protection regulation has been empirically proven to introduce barriers to entry, especially for small companies.358 Environmental, safety, and health regulations protect consumers while inhibiting the free market.359 Consider a specific example of the tension between consumer protection and competition. The Fair Credit Reporting Act360 provides an important service to consumers by protecting the fairness, accuracy, and privacy of personal information kept by credit reporting agencies.361 At the same time, these protections introduce high compliance costs that have limited entry in the credit reporting industry.36 2 The four incumbents that dominate the market were established before the Act was passed.363

Safeguarding privacy as an aspect of consumer protection provides similar examples of tensions with promoting competition. In the U.S., the Children's Online Privacy Protection Rule (COPPA) establishes strict requirements on websites that target children.36 4 These limitations guard the privacy of children but have also led to less innovation in children's websites and apps in the country. Many apps targeted at children are developed in countries that have weaker privacy protections for children, such as Ukraine.365 The passage of General Data Protection Regulation (GDPR),366 a sweeping privacy legislation in Europe, led to increased control by consumers over their personal data.36 7 Simultaneously, it decreased competition among technology vendors and shrank overall business.368 The anticompetitive effects are unsurprising, given that the average cost of compliance with the regulation was £1.67 million.369 Additionally, privacy regulation in the U.S. focuses on regulating interfirm data transfers over intrafirm uses, privileging large tech companies that are able to commercialize user data on their own. 370 This may have the effect of further entrenching monopolists, contrary to the goals of antitrust. This conflict between consumer protection, including the protection of privacy, and antitrust poses a problem of incompatible missions for the FTC.

#### Effective FTC privacy regs are key to telehealth

Hall, 14

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The success of telehealth could be undermined if serious privacy and security risks are not addressed. For example, sensors that are located in a patient’s home or that interface with the patient’s body to detect safety issues or medical emergencies may inadvertently transmit sensitive information about household activities. Similarly, routine data transmissions from an app or medical device, such as an insulin pump, may be shared with third-party advertisers. Without adequate security and privacy protections for underlying telehealth data and systems, providers and patients will lack trust in the use of telehealth solutions. Although some federal and state guidelines for telehealth security and privacy have been established, many gaps remain. No federal agency currently has authority to enact privacy and security requirements to cover the telehealth ecosystem. This article examines privacy risks and security threats to telehealth applications and summarizes the extent to which technical controls and federal law adequately address these risks. We argue for a comprehensive federal regulatory framework for telehealth, developed and enforced by a single federal entity, the Federal Trade Commission, to bolster trust and fully realize the benefits of telehealth. Telehealth involves the use of telecommunication technologies to prevent and treat illness and promote the health of individuals and populations. Although telehealth has particular benefits for rural and underserved populations, it is increasingly recognized for its potential to control costs while providing real-time tools to promote wellness, prevent disease, and enable the home management of chronic conditions. Telehealth frequently involves bidirectional, digital collection and communication of sensitive health information among health care providers and patients. For a medical device to qualify as a telehealth device, there must be communication of health information from the device over a network. For example, a glucose monitor becomes a telehealth device when it sends readings to a provider or a provider’s information system over an information network. Similarly, some generic communications technologies—such as videoconferencing—are frequently used to communicate health care information and thus become telehealth tools in those settings. Telehealth devices include mobile software applications (apps) in addition to hardware. This article focuses on network-enabled telehealth devices where a device collects information from the patient (for example, measuring a function of the body or scanning the environment for safety risks) and then transmits data to a health care provider. To realize telehealth’s full potential, however, patients and providers must trust telehealth systems to keep personal information private and secure. We identify privacy and security risks of telehealth systems, summarize the extent to which technical controls and current federal laws do—and do not—adequately address those risks, and include recommendations for building and maintaining public trust in telehealth systems through a comprehensive regulatory framework developed and enforced by the Federal Trade Commission (FTC). Potential Privacy Risks Privacy risks of telehealth involve a lack of controls or limits on the collection, use, and disclosure of sensitive personal information. Sensors that are located in a patient’s home or that interface with the patient’s body to detect safety issues or medical emergencies may inadvertently collect sensitive information about household activities. For instance, home sensors intended to detect falls may also transmit information such as interactions with a spouse or religious activity, or indicate when no one is home. Routine transmissions from a medical device may be collected and stored by the device or app manufacturer, not just the health care provider. A mobile health app may be financed by sharing potentially sensitive data from the app with third-party advertisers that target ads to patients based on app use. Such collection, use, and disclosure of information may be beyond what patients reasonably expect given anticipated uses of the technology. For example, in 2011 the popular fitness device Fitbit inadvertently exposed users’ self-reported sexual activity, failing to acknowledge that some forms of physical exertion may be sensitive information.1 Patients give consent for having a device implanted or sensors embedded, or for using a health app. However, overreliance on consent too often results in weak privacy protections. Patients frequently do not read or fully understand privacy policies, and consent shifts the burden of privacy protection to the patient, who may not be able to make meaningful privacy choices.2 Privacy Controls Privacy is typically protected by laws or operating policies that implement Fair Information Practice Principles (FIPPs). FIPPs are widely accepted practices, including the ability to access one’s own health information and request corrections; limitations on information collection, use, and disclosure; and reasonable opportunities to make choices about one’s own health information. Providing people with choices for information sharing is only one of the FIPPs, bolstered by others that require data holders to establish and abide by contextually appropriate limits on data access, use, and disclosure. The Health Insurance Portability and Accountability Act (HIPAA) of 1996 is one of several sectoral federal laws designed to implement these principles. Current laws, however, do not adequately cover the telehealth environment, as discussed in later sections. Thus, there is no guaranteed right (and often little capability) for individuals to request copies of information collected by apps or home monitoring devices. Information use and disclosure is largely determined by technology companies, with few (if any) legal limits or meaningful opportunities for individuals to control information flow.3 Potential Security Risks Detailing the security risks and appropriate security controls for telehealth systems involves specifying what kinds of security threats they should protect against. In telehealth delivery models involving provider-to-provider communication, the entities at both ends are typically required by HIPAA to implement appropriate security safeguards, such as authentication and data encryption measures (see “Security Controls” below). However, in telehealth models where one end of the communication (“endpoint”) is the patient (for example, an implantable device that sends signals to a physician, or a mobile health app on a patient’s cell phone), that endpoint falls outside the controlled and supervised environment of a HIPAA-regulated clinical care setting, magnifying existing privacy and security concerns. For a typical telehealth system where a provider communicates with a patient, relevant threats include breach of confidentiality during collection of sensitive data or during transmission to the provider’s system; unauthorized access to the functionality of supporting devices as well as to data stored on them; and untrusted distribution of software and hardware to the patient. Although we are unaware of direct harm to patients associated with a security flaw in a telehealth system, there have been academic demonstrations of such problems. For instance, certain insulin pumps have been shown to be vulnerable to hacking.4 There also have been instances where unauthorized software, such as file-sharing software installed by a health care employee, led to a breach of health information and medical identity theft.5 Security Controls A number of existing technical controls can protect against these security risks.6 Data encryption—where data are electronically “locked” using complex mathematics and encryption “keys”—can ensure that if an attacker gains access to the raw data, those data will be meaningless. There are various functional types of data encryption: while data are “at rest” (being stored) or “in transit” (being transmitted), and from “end to end” (a type of encryption that does not depend on the state of the data). At-rest and in-transit encryption typically rely on encryption methods provided by operating systems and browsers. These methods are usually external to the telehealth software. With end-to-end encryption, encryption may be directly incorporated into the telehealth application. Encryption of data at rest ensures that when an attacker bypasses access controls, the data are meaningless. Encryption of data in transit guarantees that data are meaningless if a transmission is intercepted. In “end-to-end” encryption, unencrypted information is only ever available at the two endpoints and never between.7 With encryption, anyone with the correct key can retrieve meaningful data. Access to the underlying information system, however, can be further controlled using authentication and access control mechanisms, which restrict access to information based on the identity of the person accessing the data or his or her role within an organization. In addition, medical and consumer devices typically used by patients for telehealth applications can themselves pose serious risks, as the devices contain numerous security flaws and are constantly under attack from threats such as malware.8 Mobile platforms control this by prohibiting the installation of software that has not been examined and approved. A final security control for telehealth software and devices involves initially distributing them to patients in a face-to-face setting. This enables the provider to establish the identity of the patient and authenticate the device she or he is using. This way, providers know they are not introducing security risks by accepting data from a potentially unsafe patient device (from a security, not a health risk, standpoint), and patients have some assurance about the quality of the hardware and software, because they interact with an experienced provider to obtain, install, and configure the device. HIPAA Protections HIPAA privacy and security regulations provide protections for identifiable health information, but only when it is collected and shared by “covered entities”—health care providers who bill electronically using HIPAA standards, health plans, and health care clearinghouses.9 When it applies, HIPAA’s Privacy Rule establishes limits on the use and disclosure of identifiable health information, and its Security Rule establishes technical, physical, and administrative safeguards to be adopted to protect electronic identifiable health information. For example, encryption of data at rest and in transit is an “addressable implementation specification” under the Security Rule, meaning that HIPAAcovered entities are expected to implement it unless it is not “reasonable and appropriate” to do so.10 In addition, the regulation states, providers are required to adopt identity management protocols and access controls. In the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009, Congress extended HIPAA to “business associates,” entities that “create, receive, maintain, or transmit” identifiable health information to perform a function or service “on behalf of” a covered entity.11 Whether a vendor of a patient-facing telehealth technology is a HIPAA business associate depends on whose interests are being served by the technology. Relevant questions include the following: Who provides the technology to the patient (for example, is it a direct-to-patient transaction, or is the technology provided by the doctor)? Who benefits from the technology being offered? Who is responsible for the day-to-day operation of the technology (an indication of who is ultimately responsible)? And who controls the information generated by the technology? Mere connectivity between a device and a health care provider does not render the device manufacturer a business associate of that provider.12 Other Federal Protections Given HIPAA’s limited applicability to patientfacing telehealth systems,13 its protections will not apply to information collected by most digital tools provided to patients. Additional federal laws provide some protections, however. In section 13407(f)(2) of the HITECH Act, Congress established breach notification requirements for personal health records. The requirements are overseen by the FTC. Section 13400(11) of the HITECH Act defines a personal health record as an electronic record of identifiable information “drawn from multiple sources and…managed, shared, and controlled” by the patient. Some tools of telehealth, such as network-enabled medical devices, would not fit this definition, as they do not draw information from multiple sources and are not typically controlled by the patient. As a result, the HITECH breach notification provisions will not apply. The FTC also has authority under the Federal Trade Commission Act to prevent, and seek redress for, unfair or deceptive acts or practices.14 The FTC has used this authority frequently to penalize consumer-facing, for-profit companies for failing to abide by commitments regarding data use made in privacy policies and less frequently to stop unfair practices involving data use and collection.15 As a result, patients using apps and other telehealth devices must largely rely on company policies regarding uses of data, typically found in a company’s privacy policy or the license agreement. These policies are frequently offered to users unilaterally: Accept the terms or don’t use the product. Unfortunately, in the case of medical devices, patients often do not have a choice. The FTC also expects companies to implement reasonable security safeguards and has acted in cases of unfair design, unfair default settings, and unfair data security practices that cause substantial injury to consumers and are not offset by other benefits.15 Because the FTC does not set detailed requirements for either data privacy or security, protections for telehealth technologies not covered by HIPAA are largely dependent on the technology vendor’s discretion. If a telehealth technology qualifies as a medical device, the Food and Drug Administration (FDA) may also regulate it. The FDA does not directly address privacy issues but focuses on security to the extent that it affects medical device safety. (The FDA regulation of mobile medical apps is discussed in greater detail elsewhere in this issue.)16 In June 2013 the FDA issued draft guidance on “management of cybersecurity in medical devices,”17 which urges manufacturers to develop security controls to maintain information “confidentiality, integrity and availability.” In August 2013 the FDA finalized guidance regarding radio frequency wireless technology in medical devices.18 And in September 2013 the FDA issued broad guidance on the regulation of mobile medical apps, clarifying that some types of mobile medical apps will be considered medical devices and regulated by the FDA as such.19 Through these guidance documents, the FDA is establishing a federal baseline for security in telehealth, but the FDA’s authority has limits. The FDA oversees only technologies it considers to be medical devices and focuses only on security protections designed to ensure safety. It does not focus on privacy safeguards that enforce rules or policies regarding collection, use, and disclosure of potentially sensitive health information. Building Trust A comprehensive federal policy framework protecting the privacy and security of information collected by telehealth technologies is needed to safeguard patients and bolster public trust. Such protections should be consistent with HIPAA, to ensure a rational and predictable policy environment, but they also should respond to threats to privacy and security that are more characteristic of patient- and consumer-facing technologies. Specifically, policy should address issues such as deficiencies in security safeguards, reliance by app companies on advertising within the apps, and consumers’ lack of access to their information. Such policies should be tailored to address the unique telehealth risks we have identified here. The policies should cover data collection, use, and disclosure, for both the intended purpose of the technology and any secondary data uses, such as for analytics. They should also be flexible enough to support innovation. There are a number of challenges to crafting such a policy framework. Privacy and security concerns sometimes can conflict with practicality for patients and industry. Privacy and security controls that do not anticipate the needs and preferences of the intended users are less likely to be deployed. For example, only half of iPhone users lock their devices with a passcode, which prompted Apple to integrate a fingerprint reader into newer models of the iPhone to make it easier to lock the device.20 This tension between operational practicality on the one hand and privacy and security on the other also exists in other sectors, such as telecommunications and banking. Both the Cable TV Privacy Act of 1984 and the Telecommunications Act of 1996 prevent the disclosure of personal information without consent and also provide some FIPPs-like protections, while balancing the business and operational needs of cable and telecommunications providers by al lowing the sharing of personal information if the customer fails to opt out of such sharing.21,22 In banking, the Fair Credit Reporting Act of 1970 and the Gramm-Leach-Bliley Act of 1999 heavily regulate what credit reporting agencies and financial services companies can do with personal information, providing for conspicuous and regular notice of privacy practices and rights of correction and transparency for consumers. However, these laws also favor an opt-out approach for sharing personal information—allowing data to flow by default to other companies unless the customer specifically opts out.23,24 Unfortunately, no federal agency currently has authority to enact privacy and security requirements to cover the telehealth ecosystem. We argue that Congress must establish general standards for data protection in telehealth and vest primary authority for telehealth privacy and security oversight with one federal agency. The Department of Health and Human Services (HHS), with experience in implementing HIPAA and overseeing US health programs, is an obvious candidate. However, no HHS office or agency has experience with the privacy and security risks introduced by consumer-facing commercial technologies, and, as noted above, the FDA’s focus is on safety, not privacy. The ideal agency should have a track record of experience on privacy and technical security issues and be nimble and supportive of innovation. The FTC, with its growing technical expertise and long experience in evaluating the privacy risks of consumer-facing technologies, is the agency within the federal government most equipped to regulate information privacy, including within networked telehealth systems. With respect to telehealth, Congress should give the FTC two-part authority. First, building on the Department of Commerce’s 2010 outline for “voluntary enforceable codes of conduct” with respect to consumer privacy,25 the FTC should facilitate development of voluntary codes of conduct by telehealth manufacturers and other interested stakeholders that include baseline privacy and security protections. Because the telehealth environment is rapidly evolving, involvement of manufacturers and other stakeholders in developing privacy and security codes of conduct is critical. The FTC, under its existing authority to regulate deceptive and unfair practices, can enforce these protections among telehealth manufacturers that commit to adopting them. To induce industry to develop and adopt these codes of conduct, the FTC should provide a safe harbor from enforcement action for those activities governed by the codes. To ensure meaningful protections, safe harbor should be granted only to codes that the FTC deems to be sufficiently consumer protective.

#### US telehealth solves global pandemics

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2.6.1 Surveillance and contact tracing As EVD began to spread across the affected West Africa region in 2014, identifying cases and then tracking them became paramount in stemming the tide of the infection. In contrast to many disasters, which are bounded, pandemics based on infections fail to recognize international borders or other normal boundaries. In order to contain this disease as it spread, we would have required scalable and sustained responses. These include: 1) Early recognition, coordination, and collaboration among affected nations and regions; 2) Understanding the disease penetration and transmission dynamics with surveillance and contact tracing; 3) Utilization of existing technologies in information processing and communication (such as mobile phones) to aid in better understanding the tempo and spread of the disease. These systems, coupled with research activities, early diagnostics, tracking and mapping capabilities (especially in a mobile population), risk factor assessment and treatment effectiveness, become essential to decision-makers in implementing effective control and treatment measures [45]. Given the penetration of mobile phones in Africa, individuals seeking information about the disease, including where to refer themselves or family members for care, could provide important information regarding the potential spread of the illness. Geographic location of callers is often mandated to be available to emergency services in times of crisis. However, in humanitarian context situations, such processes may not have the regulatory precedent to be implemented, potentially hindering the response effort. During the EVD outbreak, Sierra Leone deployed caller location services within its 117 Ebola Response Centers. Two projects were implemented concurrently: 1) Cell tower locations were supplemented by information collected by 117 call operators, and 2) Real-time location services of callers were deployed rapidly to support emergency services’ response efforts. Privacy issues did occur, though these were in part addressed with software solutions [46]. Typically, once a potential contact with a patient occurs, tracking them is a paper-based system involving data collection forms, data aggregation from local sites, data entry into a database, data aggregation on a regional scale, data review and reporting, and finally report submission to national decision-makers. Such a process can be especially challenging not only within the context of the area from which the epidemic surged, but also given the 21-day incubation period of EVD. In 2014, a team designed and implemented a smartphone-based contact tracing system that was linked to data analysis and visualization. The project, started in Conakry, Guinea, eventually expanded into five prefecture regions over six months, tracking more than 9000 individuals. The system was based upon the CommCare mobile application and was integrated with Tableau, a business intelligence software using protocols publically available from the CDC as well as the WHO. The contact software was designed to not only intake information on affected persons, but also to track their movements using time stamps and data location. Dashboards helped to display the information and performance of the collection methodology. Data validation occurred with test comparisons with paper-based systems, eventually approaching 90 % agreement [47]. 2.6.2 Education and information dissemination Health information technology (HIT) using electronic health records (EHR) has developed with mostly passive utilization for providers to get real-time information on medications, laboratory and imaging results, and to provide a method of documenting care. Its use in emerging illnesses or disasters such at EVD is less well described. Once available, providers did embrace HIT in caring for patients suffering from the EVD disease. The WHO and the CDC actively disseminated current information on diagnosis, treatment and supportive care, such as the proper use of personal protective equipment. However, while EHRs helped support individual episodes of care, they proved less helpful in sharing that information during the outbreak. One problem that occurred was the concept of “technology-induced error” where critical data that may have proved useful in tracking the disease or evaluating it on a population basis was hindered by the non-standard placement of the information in the EHR [48]. Symptom monitoring apps and other mobile applications were less well developed during EVD, with the exception of outbreak tracking maps. Ushahidi did develop a mapping tool to track the disease using crowd-sourced data. Also, the International Red Cross sent two million text messages each month in an effort to spread current knowledge [49]. One challenge in the development and usage of such tools, however, stems from mobile phone penetration in Africa. While mobile phone use is extensive throughout much of Africa, smartphone availability is less so, estimated in January 2014 at 12 % [48]. ClinPak is a US-developed, Nigeria-implemented mobile EMR system designed to track a patient’s medical history, active medical problems and associated treatments in a point-of-care platform. It has been successfully implemented in Nigeria for improving maternal health, but found a new use during the EVD outbreak. Important especially early in the outbreak was information dissemination; ClinPak supported the development of other mobile apps to help disseminate EVD information [49]. Potential next steps that might be useful to streamline the use of EHRs and apps include: 1) Standardize the methodology in programming data in EHRs and apps; 2) Create and improve apps’ functionality; 3) Remove constraints on data input for contextualized diagnosis (e.g., using the open.fda.gov model), and 4) Make information and usage available at point of care [50]. 2.6.3 Discussion According to the CDC, current estimates put the total number of cases at approximately 24,797 with about 8764 deaths since March 2014 [51, 52]. While the number of new cases has flattened out since the peak early summer of 2015, the crisis continues nearly two years after it began. Many fault the WHO for its mismanagement of the crisis during its earlier stages. Had there been a more concerted international effort at the onset of the crisis we may not have seen such a dramatic increase in the total number of cases. It is important to note that many of the cases seen outside of West Africa were the result of healthcare workers returning to their country of origin. Cybercare could have tracked all of the cases and allowed a more timely response to the disease outbreak. With communicable diseases, we do not have the luxury to evacuate the patients in large numbers. We need to isolate diseased patients, treating them in place with either isolation (if they are infected) or quarantine (if they have had contact with infected individuals). Cybercare provides the electronic tools to allow this treatment to happen. The use of telemedicine and robotics is crucial to treating at a distance, allowing quarantine and isolation of individuals who are infected or exposed to the disease. If we transport these patients, we risk infecting the rest of the country or the world. This is what we began to see in Ebola in West Africa where individuals traveled out of the country with this highly deadly communicable disease. In the future we need a healthcare system in place to treat pandemics when Ebola or Middle East Respiratory Syndrome coronavirus (MERS-CoV) infect individuals who travel internationally. The system will need to be able to stop the spread of disease with vaccines (i.e., make vaccines rapidly with new technologies to produce large quantities in weeks rather than months; deliver vaccines with robotic-controlled drones); treat exposed or infected patients with isolation or quarantine; and track patients with both communicable disease as part of the pandemic, and non-communicable chronic diseases like diabetes that require ongoing treatment. The system should also anticipate a pandemic by examining susceptible populations, determining if any individuals are infected, and treating them early. Prior pandemics such as SARS had lower transmission and death rates than Ebola, whose mortality is extremely high. Cybercare is ideal for remotely treating a pandemic because it provides telemedicine for treatment at a distance, along with aggressive task shifting, and the technology for advanced quarantine and isolation with robotics. As medical responders set up 11 hospitals in West Africa for Ebola, we could have positioned key technologies. An example: IVs were crucial in Ebola to reduce the fatality from 80 to 40 %. Yet, placing an IV in an Ebola patient is very dangerous for a pandemic provider (personal quote, Tom Crabtree). We could have placed explosive ordnance robots at those hospitals as remote-controlled nurses. Robot nurses already exist [53]. We need to teach the robots to place intravenous lines and care for patients in situations where the risk of provider infection is so high — this will certainly be possible before 2030. Travel is very dangerous in a pandemic of Ebola or even SARS. Patients need to know and believe that by staying in place they will receive the best care possible. This will protect those across borders from becoming infected. In 2030, our response to pandemics will dramatically improve with Cybercare. 3 Conclusion: the way forward Cybercare will provide the foundation for healthcare delivery in the future. It is based on seven pillars of information technology (genomics; telemedicine; robotics; simulation, including virtual and augmented reality; AI; the EMR; and smartphones) that support three key paradigms. We will shift care from treatment to prevention, from specialist to generalist, and from the hospital to the home. Cybercare could help enhance private health and public health; address the GBD with treatment for communicable illnesses; and help the aging population cope with their chronic illnesses in the developed world. Cybercare is already accomplishing many of the goals we outlined almost a decade ago [3]. Medical providers are available in some drugstores (we envisioned this in 2008, and it is now a reality), and via telemedicine (this was in early stages in 2008, and is now widely implemented). Many patient-monitoring devices and cell phone apps exist to collect health data for the use of both patients and providers. Over the next 15 years, we will see a dramatic acceleration in the use of technology in health care. By 2030, we expect that much of what we have predicted in this paper will be in place in the US healthcare system and in the Global healthcare environment. Telemedicine is the oldest, best-known Cybercare technology, but that is rapidly changing as technologies evolve and merge. For example, telemedicine is now being done on a smartphone. New technologies will develop that enhance this model. Information fusion and techniques for management (of big data, information, knowledge and wisdom) promise to play a central future role in the prevention and detection of the burden of disease as well as its remediation. Oracle has implemented this technology in Indonesia, Singapore, and Australia [26].

#### **Disease causes extinction.**

Ord ‘20 [Toby; reporter for the Guardian; 3-6-2020; "Why we need worst-case thinking to prevent pandemics"; Guardian; https://www.theguardian.com/science/2020/mar/06/worst-case-thinking-prevent-pandemics-coronavirus-existential-risk]

The world is in the early stages of what may be the **most deadly pandemic** of the **past 100 years**. In China, thousands of people have already died; large outbreaks have begun in South Korea, Iran and Italy; and the rest of the world is bracing for impact. We do not yet know whether the final toll will be measured in thousands or hundreds of thousands. For all our advances in medicine, humanity remains much **more vulnerable** to pandemics than we would like to believe. To understand our vulnerability, and to determine what steps must be taken to end it, it is useful to ask about the very worst-case scenarios. Just how bad could a pandemic be? In science fiction, we sometimes encounter the idea of a pandemic so severe that it could cause **the end of civilisation,** or even of **humanity itself.** Such a risk to humanity’s entire future is known as an **existential risk.** We can say with certainty that the novel coronavirus, named Covid-19, does not pose such a risk. **But could the next pandemic?** To find out, and to put the current outbreak into greater context, let us turn to the past. In 1347, death came to Europe. It entered through the Crimean town of Caffa, brought by the besieging Mongol army. Fleeing merchants unwittingly carried it back to Italy. From there, it spread to France, Spain and England. Then up as far as Norway and across the rest of Europe – all the way to Moscow. Within six years, the Black Death had taken the continent. Tens of millions fell gravely ill, their bodies succumbing to the disease in different ways. Some bore swollen buboes on their necks, armpits and thighs; some had their flesh turn black from haemorrhaging beneath the skin; some coughed blood from the necrotic inflammation of their throats and lungs. All forms involved fever, exhaustion and an intolerable stench from the material that exuded from the body. There were so many dead that mass graves needed to be dug and, even then, cemeteries ran out of room for the bodies. The Black Death **devastated Europe.** In those six years, between a **quarter and half of all Europeans were killed**. The Middle East was ravaged, too, with the plague killing about **one in three Egyptians and Syrians**. And it may have also laid waste to parts of central Asia, India and China. Due to the scant records of the 14th century, we will never know the true toll, but our best estimates are that somewhere between **5% and 14% of all the world’s people were killed**, in what may have been the **greatest catastrophe** humanity has seen. The Black Death was not the only biological disaster to scar human history. It was not even the only great bubonic plague. In AD541 the plague of Justinian struck the Byzantine empire. Over three years, it **took the lives** of roughly **3% of the world’s people.** When Europeans reached the Americas in 1492, the two populations exposed each other to completely novel diseases. Over thousands of years, each population had built up resistance to their own set of diseases, but were extremely susceptible to the others. The American peoples got by far the worse end of the exchange, through diseases such as measles, influenza and, especially, smallpox. During the next 100 years, a combination of invasion and disease took an immense toll – one whose scale may never be known, due to great uncertainty about the size of the pre-existing population. We can’t rule out the loss of more than 90% of the population of the Americas during that century, though the number could also be much lower. And it is very difficult to tease out how much of this should be attributed to war and occupation, rather than disease. At a rough estimate, as many as 10% of the world’s people may have been killed. Centuries later, the world had become so interconnected that a truly global pandemic was possible. Towards the end of the first world war, a devastating strain of influenza, known as the 1918 flu or Spanish flu, spread to six continents, and even remote Pacific islands. About a third of the world’s population were infected and between 3% and 6% were killed. This death toll outstripped that of the first world war. Yet even events like these fall short of being a threat to humanity’s long-term potential. In the great bubonic plagues we saw civilisation in the affected areas falter, but recover. The regional 25%-50% death rate was not enough to precipitate a continent-wide collapse. It changed the relative fortunes of empires, and may have substantially altered the course of history, but if anything, it gives us reason to believe that human civilisation is likely to make it through future events with similar death rates, even if they were global in scale. The Spanish flu pandemic was remarkable in having very little apparent effect on the world’s development, despite its global reach. It looks as if it was lost in the wake of the first world war, which, despite a smaller death toll, seems to have had a much larger effect on the course of history. The full history of humanity covers at least 200,000 years. While we have scarce records for most of these 2,000 centuries, there is a key lesson we can draw from the sheer length of our past. The chance of human extinction from natural catastrophes of any kind must have been very low for most of this time – or we would not have made it so far. But could these risks have changed? Might the past provide false comfort? Our population now is a **thousand times greater** than it was for most of human history, so there are vastly **more opportunities** for new **human diseases to originate.** And our farming practices have created **vast numbers of animals** living in **unhealthy conditions** within **close proximity to humans**. This increases the risk, as many major diseases originate in animals before crossing over to humans. Examples include HIV (chimpanzees), Ebola (bats), Sars (probably civets or bats) and influenza (usually pigs or birds). We do not yet know where Covid-19 came from, though it is very similar to coronaviruses found in bats and pangolins. Evidence suggests that diseases are crossing over into human populations from animals at an increasing rate. **Modern civilisation** may also make it much easier for a **pandemic to spread**. The higher density of people living together in cities **increases the number of people** each of us may infect. Rapid **long-distance transport** greatly increases the **distance pathogens can spread**, reducing the **degrees of separation** between any two people. Moreover, we are no longer divided into isolated populations as we were for most of the past 10,000 years. Together these effects suggest that we might expect **more new pandemics**, for them to **spread more quickly**, and to reach a **higher percentage** of the **world’s people**. But we have also changed the world in ways that offer protection. We have a healthier population; improved sanitation and hygiene; preventative and curative medicine; and a scientific understanding of disease. Perhaps most importantly, we have public health bodies to facilitate global communication and coordination in the face of new outbreaks. We have seen the benefits of this protection through the dramatic decline of endemic infectious disease over the past century (though we can’t be sure pandemics will obey the same trend). Finally, we have spread to a range of locations and environments unprecedented for any mammalian species. This offers special protection from extinction events, because it requires the pathogen to be able to flourish in a vast range of environments and to reach exceptionally isolated populations such as uncontacted tribes, Antarctic researchers and nuclear submarine crews. It is hard to know whether these combined effects have increased or decreased the existential risk from pandemics. This uncertainty is ultimately bad news: we were previously sitting on a powerful argument that the **risk was tiny**; now **we are not.** We have seen the indirect ways that our actions aid and abet the origination and spread of pandemics. But what about cases where we have a much more direct hand in the process – where we deliberately use, improve or create the pathogens? Our understanding and control of pathogens is very recent. Just 200 years ago, we didn’t even understand the basic cause of pandemics – a leading theory in the west claimed that disease was produced by a kind of gas. In just two centuries, we discovered it was caused by a diverse variety of microscopic agents and we worked out how to grow them in the lab, to breed them for different traits, to sequence their genomes, to implant new genes and to create entire functional viruses from their written code. This progress is continuing at a rapid pace. The past 10 years have seen major qualitative breakthroughs, such as the use of the gene editing tool Crispr to efficiently insert new genetic sequences into a genome, and the use of gene drives to efficiently replace populations of natural organisms in the wild with genetically modified versions. This progress in biotechnology seems unlikely to fizzle out anytime soon: there are no insurmountable challenges looming; no fundamental laws blocking further developments. But it would be optimistic to assume that this uncharted new terrain holds only familiar dangers. To start with, let’s set aside the risks from malicious intent, and consider only the risks that can arise from well-intentioned research. Most **scientific and medical research** poses a negligible risk of harms at the scale we are considering. But there is a small fraction that uses **live pathogens** of kinds that are known to **threaten global harm**. These include the agents that cause the **Spanish flu, smallpox, Sars and H5N1 or avian flu**. And a small part of this research involves **making strains** of these pathogens that pose **even more danger** than the natural types, increasing their **transmissibility**, lethality or resistance to vaccination or treatment. In 2012, a Dutch virologist, Ron Fouchier, published details of an experiment on the recent H5N1 strain of bird flu. This strain was extremely deadly, killing an estimated **60% of humans it infected** – far beyond even the Spanish flu. Yet its inability to pass from human to human had so far **prevented a pandemic**. Fouchier wanted to find out whether (and how) H5N1 could naturally develop this ability. He passed the disease through a series of 10 ferrets, which are commonly used as a model for how influenza affects humans. By the time it passed to the final ferret, his strain of H5N1 had become directly transmissible between mammals. The work caused fierce controversy. Much of this was focused on the information contained in his work. The US National Science Advisory Board for Biosecurity ruled that his paper had to be stripped of some of its technical details before publication, to limit the ability of bad actors to cause a pandemic. And the Dutch government claimed that the research broke EU law on exporting information useful for bioweapons. But it is not the possibility of misuse that concerns me here. Fouchier’s research provides a clear example of well-intentioned scientists enhancing the destructive capabilities of pathogens known to threaten global catastrophe. Of course, such experiments are done in secure labs, with stringent safety standards. It is highly unlikely that in any particular case the enhanced pathogens would escape into the wild. But just how unlikely? Unfortunately, we don’t have good data, due to a lack of transparency about incident and escape rates. This prevents society from making well-informed decisions balancing the risks and benefits of this research, and it limits the ability of labs to learn from each other’s incidents. Security for highly dangerous pathogens has been **deeply flawed**, and remains insufficient. In 2001, Britain was struck by a devastating outbreak of foot-and-mouth disease in livestock. Six million animals were killed in an attempt to halt its spread, and the economic damages totalled £8bn. Then, in 2007, there was another outbreak, which was traced to a lab working on the disease. Foot-and-mouth was considered a **highest-category pathogen**, and required the highest level of biosecurity. Yet the virus escaped from a **badly maintained pipe**, leaking into the **groundwater at the facility**. After an investigation, the **lab’s licence was renewed** – only for **another leak to occur two weeks later.** In my view, this track record of escapes shows that even the **highest biosafety level** (BSL-4) is **insufficient for working on pathogens** that pose a risk of global pandemics on the scale of the Spanish flu or worse. Thirteen years since the last publicly acknowledged outbreak from a **BSL-4 facility** is not good enough. It doesn’t matter whether this is from insufficient standards, inspections, operations or penalties. What matters is the poor track record in the field, made worse by a lack of transparency and accountability. With current BSL-4 labs, an **escape of a pandemic pathogen** is only a **matter of time.**

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#### We meet increased prohibitions – Unfair and deceptive acts or practices and invitations to collude offense are examples of civil anticompetitive business practices covered under Section 5 of the FTC that could be considered criminal violations by the DOJ under the plan

Lisa Kimmel 20, Senior Counsel at Crowell & Moring, LLP in Washington, D.C., twenty years of experience as an antitrust lawyer and holds a Ph.D. in economics from the University of California at Berkeley; and Eric Fanchiang, associate in Crowell & Moring’s Irvine, CA office and a member of the firm’s antitrust and commercial litigation groups, 2020, “Antitrust and Intellectual Property Licensing,” in 2020 Licensing Update, Wolters Kluwer Legal & Regulatory U.S., https://www.crowell.com/files/20200401-Licensing-Update-Chapter-13.pdf

U.S. antitrust law is defined by federal and state statutes, as interpreted by the courts. The core federal statutes are the Sherman Act,1 passed by Congress in 1890, and the Federal Trade Commission2 and Clayton Acts,3 both passed in 1914. The United States Department of Justice (“DOJ”) and the Federal Trade Commission (“FTC” or “Commission”) (together the “agencies”) share enforcement of most areas of federal antitrust law but with some differences in the scope of their authority. The FTC has sole authority to enforce Section 5 of FTC Act, which prohibits (1) unfair methods of competition and (2) unfair or deceptive acts or practices. The FTC almost always pursues claims for anticompetitive conduct as unfair methods of competition and reserves charges of unfair or deceptive acts or practices for consumer protection violations. Though the FTC's authority to challenge unfair methods of competition goes beyond conduct prohibited by the Sherman and Clayton Acts, in practice the FTC brings most unfair methods of competition cases under the same standards that courts apply to Sherman Act claims. The most prominent exception is the invitation to collude offense, which falls outside the scope of the Sherman Act (if the invitation is not accepted, there is no agreement). The FTC challenges invitations to collude as so-called “standalone” violations of Section 5.4 The DOJ has sole authority to pursue criminal violations of the antitrust laws. Most states have their own state antitrust and unfair competition statutes. State law follows federal law to some extent, though as discussed below, may differ from federal law in meaningful ways that vary state to state. State attorneys general and private parties can also typically file suit to enforce both federal and state antitrust law.

#### Counterinterp—the scope of core antitrust laws are the extent to which activities are regulated. The plan meets the counter-interp because we expand what activities are regulated by the Sherman Act.

Graham 10 – Law professor at the University of Leicester. He specializes in competition law and was a member of the UK’s Competition Commission from 1999-2008.

Cosmo Graham, “2: The prohibition on anti-competitive agreements,” *EU and UK Competition Law*, Longman 2010, pp. 66, https://www.pearsonhighered.com/assets/samplechapter/g/r/a/h/Graham-Comp%20law\_C02.pdf.

European Community competition law only applies to ‘undertakings’, a word used not only in Article 81 but also in Articles 82 and 86, although there is no definition of the term in the Treaties. This is therefore a question relating to the scope of competition law, that is, to what extent are particular activities to be regulated by the rules on competition as opposed to other considerations? The question of whether or not an entity is or is not an undertaking is therefore an absolutely critical one for deciding whether or not there is a competition issue to discuss. Underlying this technical question is a much wider policy issue about how far we are prepared to see decisions in particular areas of social life determined by market forces and how far we want other considerations to predominate. For example, how far should arrangements relating to health care, welfare benefits, the regulation of professions and the regulation of sport be subject to the rules on competition law and how far should they be decided on other grounds? This is an issue that the European Courts have struggled with.

#### The plan expands the scope of criminal violations considered in anticompetitive behavior

William E. Kovacic, 1996, Professor of Law at George Mason University, “Downsizing antitrust: is it time to end dual federal enforcement?” 41 Antitrust BULL. 505, pg. 540//jk

If it is time to end the experiment with antitrust oversight by both DOJ and the FTC, what is the appropriate residual enforcement apparatus? For a number of reasons, DOJ seems the best locus for consolidation. Some factors favoring consolidation in DOJ are structural and involve unalterable limits on the FTC's powers. Antitrust policymaking-whether in formulating international cooperation agreements or pursuing specific investigations or cases-increasingly implicates foreign relations issues that fall within the province of the executive branch and cannot be resolved by the FTC. The Commission's enforcement authority is exclusively civil, and decisions about how to use criminal enforcement power arguably should take place in an institutional setting (such as the DOJ) where the application of criminal sanctions is related to other elements of competition policy

#### “Scope” means subsets are necessarily T

Surden 11 --- Harry Surden, Associate Professor of Law, University of Colorado Law School, “Efficient Uncertainty in Patent Interpretation”, 2011 https://scholar.law.colorado.edu/cgi/viewcontent.cgi?article=1185&context=articles

One can understand scope-of-law issues through at least two distinct analytical frameworks: one oriented upon boundaries and the other upon function. In one sense, the scope of any legal right, including a patent claim, concerns the demarcation of legal boundaries. Within law the term "legal scope" refers to both the coverage and non-coverage of a given law.96 The concept of scope suggests that application of a given legal rule will be, in some sense, limited. To reference a law’s scope is to imply that a law will not apply to all future entities, objects, and behaviors, but to some limited subset.97 From that perspective, legal scope is related to the substantive criteria by which we differentiate, ex ante, the subset of legal actors, objects, behaviors, and states that will be subject to a law’s differential treatment or legal consequences.98 A scope boundary is the "line" distinguishing that which is covered by a law from that which is not. In this sense, critiques of legal scope generally tend to focus upon demarcation of legal boundaries via the legal criteria chosen ex ante.

#### And the core antitrust laws are the Sherman, Clayton, and FTC Act. The resolution specifies “core antitrust laws” as a term of art, not THE core OF antitrust laws, which means they’re not defining something in the resolution.

Lisa Kimmel 20, Senior Counsel at Crowell & Moring, LLP in Washington, D.C., twenty years of experience as an antitrust lawyer and holds a Ph.D. in economics from the University of California at Berkeley; and Eric Fanchiang, associate in Crowell & Moring’s Irvine, CA office and a member of the firm’s antitrust and commercial litigation groups, 2020, “Antitrust and Intellectual Property Licensing,” in 2020 Licensing Update, Wolters Kluwer Legal & Regulatory U.S., https://www.crowell.com/files/20200401-Licensing-Update-Chapter-13.pdf

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#### The word scope is meaningless.

Marian P. Opala 96, Justice, Oklahoma Supreme Court, “In re PETITION NO. 363,” 1996 OK 122, Lexis

[\*P13] [\*\*\*16] The prudential bar of restraint commands that the constitutional issues pressed today not be resolved in advance of strict necessity. 28 [\*\*\*17] No necessity exists here for presubmission resolution of the constitutional validity of these premature content-based challenges to the petition. Until actual implementation by the gaming commission (or legislative enactment) has been effected, the meaning of the word scope (in the measure) remains uncertain. To now scrutinize the outer limit of that word in terms of its impact on Indian tribes would be, at best, speculative. Moreover, there is no one before us now who has standing to challenge the measure's validity for its federal and state constitutional conformity. 29 No individual tribe has thus far been adversely impacted. We hence conclude that the measure is free from facial federal or state constitutional infirmity.

#### That means you default to ordinary meaning and reasonability. Competing interps creates a race to the bottom which makes being aff impossible.

US Legal No Date “Ordinary-Meaning Rule Law and Legal Definition, US Legal, https://definitions.uslegal.com/o/ordinary-meaning-rule/

Ordinary meaning rule is a principle of statutory interpretation that when a word is not defined in a statute or other legal instrument, the court normally construes it in accordance with its ordinary or natural meaning. This rule guides courts faced with litigation that turns on the meaning of a term not defined by the statute, or on that of a word found within a definition itself.

According to this rule, statutes are to be interpreted using the ordinary meaning of the language of the statute unless a statute explicitly defines some of its terms otherwise. However, if the words are clear, they must be applied, even though the intention of the legislator may have been different or the result is harsh or undesirable.

#### “At least” means we only have to meet the latter half of the resolution

OED 21, Oxford English Dictionary, “east, adj., pron., and n., and adv.”, https://www.oed.com/view/Entry/106755?rskey=4Ogpdk&result=2&isAdvanced=false#eid1257794650

Uses of the noun following prepositions, forming adverbial phrases.

a. at least (also at the least (now less common), † atte leste).

(a) Modifying a designation of quantity or extent, indicating that the amount is the smallest admissible or is otherwise a minimum, e.g. at least two, at least once, at least double.

## Notice and Comment CP

### 2AC Notice + Comment CP

#### We stop China’s rise which causes global authoritarianism and collapse of democracy

Youssef, 20

(Nancy A Youssef, MA in Security Studies from [Georgetown University](https://en.wikipedia.org/wiki/Georgetown_University)’s [Edmund A. Walsh School of Foreign Service](https://en.wikipedia.org/wiki/Edmund_A._Walsh_School_of_Foreign_Service). "China Aims to Outpace U.S. Militarily, American Commander Says," Dec 8 <https://www.wsj.com/articles/china-aims-to-outpace-u-s-militarily-american-commander-says-11607459776> NL)

China is seeking to invest its economic growth into equaling American military capabilities by 2035 and aims to be able to defeat the U.S. in an armed conflict by midcentury, the top U.S. military commander said. “They are on a path to try to do that,” Army Gen. Mark Milley said of Beijing’s ambitions in an interview at The Wall Street Journal’s CEO Council summit on Tuesday. “It is certainly a significant security challenge for the United States now and in the years to come.” To defend against a rising China, the U.S. must develop its own economic and military power, Gen. Milley said. He warned, “We don’t want great-power competition to turn into great-power war. That would be a disaster.” Chinese officials didn’t immediately respond to a request for comment but have said previously that the country’s military is intended for peaceful purposes. Gen. Milley said the U.S. military must be prepared to launch offensive and defensive moves both in space and cyber operations, particularly against rivals like China and Russia, both of which are developing their military capabilities in those domains. ‘We don’t want great-power competition to turn into great-power war. That would be a disaster.’ — Gen. Mark Milley The chairman’s comments echoed widely held views within the Trump administration, which has intensified its pressure campaign against Beijing through visa bans, sanctions and a continuing trade war. Militarily, the Trump administration has increased freedom of navigation operations as well as other naval maneuvers in an attempt to challenge China’s claims to parts of the Asia Pacific region. John Ratcliffe, the current U.S. director of national intelligence, wrote in a Journal [opinion article](https://www.wsj.com/articles/china-is-national-security-threat-no-1-11607019599?mod=article_inline) last week, “If I could communicate one thing to the American people from this unique vantage point, it is that the People’s Republic of China poses the greatest threat to America today, and the greatest threat to democracy and freedom world-wide since World War II.”

#### Collapse of the admin state ruins democracy

Rahman 18 – Associate Professor of Law, Brooklyn Law School  
Sabeel Rahman, Visiting Professor of Law at Harvard and Fellow at the Roosevelt Institute, Reconstructing the Administrative State in an Era of Economic and Democratic Crisis, 131 Harv. L. Rev. 1671, April 2018,

The **rise of the administrative state** was thus not a politically neutral endeavor. The checks and balances that legitimate administrative authority in essence make possible (but do not guarantee) the contestation of deep forms of economic and social inequality, subordination, or hierarchy**.** This is not to say that administrative authority is always equality or inclusion promoting — hardly. But in a reality where background economic, social, and historical conditions already encode structural disparities of wealth, opportunity, power, and influence, eliminating regulatory agencies and tools that are potentially capable of addressing these disparities (even if they are not always deployed in these ways) precludes much of **equality- or inclusion-promoting public polic**y from getting off the ground in the first place. The dismantling of administrative institutions, then, is similarly nonneutral. Scholars of the administrative process have long warned of the dangers of special interest capture of regulatory agencies, which would cause administrative authority to be **redirected to serve some interests over others**. But agencies can also be captured and neutered through *inaction* — through what political scientists call “drift,” where highly resourced and sophisticated players are able to produce substantive policy change simply by holding existing rules in place in the face of changing external conditions.Dismantling agencies altogether would be an even more extreme form of opposition to these potential uses: rather than trying to capture or simply neuter the agency, more radical efforts to deconstruct regulatory institutions cut off the very possibility by **eliminating** the **regulatory capacity** itself, a kind of complete and total capture through deconstruction. This substantive valence of administrative power and its potential deconstruction adds an important layer to Michaels’s critique of privatization. Michaels alludes to the ways in which privatization risks permanently dismantling institutional tools and capacities that are difficult to rebuild. As Michaels warns, **under privatization,** “we will have hollowed out the government sector to such an extent that we may well lack **the** capacity, infrastructure, **and** know-how to **reclaim** that which has increasingly been outsourced or marketized” (p. 12). He rightly notes that privatization emerged as a “pivot[]” strategy in the Reagan era, a “second-best” to dismantling regulatory bodies themselves (p. 97). This is a problem in particular because “the Market, at least in its pure, idealized state, **is not democratic, deliberative, or juridical**. . . . It is the world of Schumpeter and Coase, not Montesquieu or Madison” (p. 5). Private corporate governance, meanwhile, cannot replicate the kinds of checks and balances that the separation of powers principles require (p. 164). **Dismantling** administration and returning to private ordering is therefore troubling for democracy **in three senses**. First, given prior background structural patterns of exclusion and disparities of wealth, power, and opportunity, a return to private economic and social ordering is by definition a return to economic inequality, social hierarchy, and exclusion. Second, the dynamics of market competition or of **corporate governance cannot replicate or replace** public **institutions** of **democracy or of checks and balances**. They operate fundamentally differently and are not substitutes. Third, a dismantling of regulatory institutions removes some of the most **vital and effective mechanisms** through which we as a **democratic public seek to contest and reshape** these background structural inequities and exclusions: **without** tools of general administrative **policymaking and enforcement**, these structural inequities are **harder to overcome and reshape**.

#### FTC ruins rule of law and democracy

Abbott, 21

(Alden, Senior Research Fellow at the Mercatus Center, George Mason, previously served as the FTC’s General Counsel, “FTC Antitrust Enforcement and the Rule of Law”, Truth on the Market, 08-09-2021, https://truthonthemarket.com/2021/08/09/ftc-antitrust-enforcement-and-the-rule-of-law/)

While imperfect and subject to potential error in application—a problem of legal interpretation generally—the consumer welfare principle has worked rather well as the focus both for antitrust-enforcement guidance and judicial decision-making. The general stability and predictability of antitrust under a consumer welfare framework has advanced the rule of law. It has given businesses sufficient information to plan transactions in a manner likely to avoid antitrust liability. It thereby has cabined uncertainty and increased the probability that private parties would enter welfare-enhancing commercial arrangements, to the benefit of society. In a very thoughtful 2017 speech, then Acting Assistant Attorney General for Antitrust Andrew Finch commented on the importance of the rule of law to principled antitrust enforcement. He noted: [H]ow do we administer the antitrust laws more rationally, accurately, expeditiously, and efficiently? … Law enforcement requires stability and continuity both in rules and in their application to specific cases. Indeed, stability and continuity in enforcement are fundamental to the rule of law. The rule of law is about notice and reliance. When it is impossible to make reasonable predictions about how a law will be applied, or what the legal consequences of conduct will be, these important values are diminished. To call our antitrust regime a “rule of law” regime, we must enforce the law as written and as interpreted by the courts and advance change with careful thought. The reliance fostered by stability and continuity has obvious economic benefits. Businesses invest, not only in innovation but in facilities, marketing, and personnel, and they do so based on the economic and legal environment they expect to face. Of course, we want businesses to make those investments—and shape their overall conduct—in accordance with the antitrust laws. But to do so, they need to be able to rely on future application of those laws being largely consistent with their expectations. An antitrust enforcement regime with frequent changes is one that businesses cannot plan for, or one that they will plan for by avoiding certain kinds of investments. That is certainly not to say there has not been positive change in the antitrust laws in the past, or that we would have been better off without those changes. U.S. antitrust law has been refined, and occasionally recalibrated, with the courts playing their appropriate interpretive role. And enforcers must always be on the watch for new or evolving threats to competition. As markets evolve and products develop over time, our analysis adapts. But as those changes occur, we pursue reliability and consistency in application in the antitrust laws as much as possible. Indeed, we have enjoyed remarkable continuity and consensus for many years. Antitrust law in the U.S. has not been a “paradox” for quite some time, but rather a stable and valuable law enforcement regime with appropriately widespread support. Unfortunately, policy decisions taken by the new Federal Trade Commission (FTC) leadership in recent weeks have rejected antitrust continuity and consensus. They have injected substantial uncertainty into the application of competition-law enforcement by the FTC. This abrupt change in emphasis undermines the rule of law and threatens to reduce economic welfare. As of now, the FTC’s departure from the rule of law has been notable in two areas: Its rejection of previous guidance on the agency’s “unfair methods of competition” authority, the FTC’s primary non-merger-related enforcement tool; and Its new advice rejecting time limits for the review of generally routine proposed mergers. In addition, potential FTC rulemakings directed at “unfair methods of competition” would, if pursued, prove highly problematic. Rescission of the Unfair Methods of Competition Policy Statement The FTC on July 1 voted 3-2 to rescind the 2015 FTC Policy Statement Regarding Unfair Methods of Competition under Section 5 of the FTC Act (UMC Policy Statement). The bipartisan UMC Policy Statement has originally been supported by all three Democratic commissioners, including then-Chairwoman Edith Ramirez. The policy statement generally respected and promoted the rule of law by emphasizing that, in applying the facially broad “unfair methods of competition” (UMC) language, the FTC would be guided by the well-established principles of the antitrust rule of reason (including considering any associated cognizable efficiencies and business justifications) and the consumer welfare standard. The FTC also explained that it would not apply “standalone” Section 5 theories to conduct that would violate the Sherman or Clayton Acts. In short, the UMC Policy Statement sent a strong signal that the commission would apply UMC in a manner fully consistent with accepted and well-understood antitrust policy principles. As in the past, the vast bulk of FTC Section 5 prosecutions would be brought against conduct that violated the core antitrust laws. Standalone Section 5 cases would be directed solely at those few practices that harmed consumer welfare and competition, but somehow fell into a narrow crack in the basic antitrust statutes (such as, perhaps, “invitations to collude” that lack plausible efficiency justifications). Although the UMC Statement did not answer all questions regarding what specific practices would justify standalone UMC challenges, it substantially limited business uncertainty by bringing Section 5 within the boundaries of settled antitrust doctrine. The FTC’s announcement of the UMC Policy Statement rescission unhelpfully proclaimed that “the time is right for the Commission to rethink its approach and to recommit to its mandate to police unfair methods of competition even if they are outside the ambit of the Sherman or Clayton Acts.” As a dissenting statement by Commissioner Christine S. Wilson warned, consumers would be harmed by the commission’s decision to prioritize other unnamed interests. And as Commissioner Noah Joshua Phillips stressed in his dissent, the end result would be reduced guidance and greater uncertainty. In sum, by suddenly leaving private parties in the dark as to how to conform themselves to Section 5’s UMC requirements, the FTC’s rescission offends the rule of law. New Guidance to Parties Considering Mergers For decades, parties proposing mergers that are subject to statutory Hart-Scott-Rodino (HSR) Act pre-merger notification requirements have operated under the understanding that: The FTC and U.S. Justice Department (DOJ) will routinely grant “early termination” of review (before the end of the initial 30-day statutory review period) to those transactions posing no plausible competitive threat; and An enforcement agency’s decision not to request more detailed documents (“second requests”) after an initial 30-day pre-merger review effectively serves as an antitrust “green light” for the proposed acquisition to proceed. Those understandings, though not statutorily mandated, have significantly reduced antitrust uncertainty and related costs in the planning of routine merger transactions. The rule of law has been advanced through an effective assurance that business combinations that appear presumptively lawful will not be the target of future government legal harassment. This has advanced efficiency in government, as well; it is a cost-beneficial optimal use of resources for DOJ and the FTC to focus exclusively on those proposed mergers that present a substantial potential threat to consumer welfare. Two recent FTC pronouncements (one in tandem with DOJ), however, have generated great uncertainty by disavowing (at least temporarily) those two welfare-promoting review policies. Joined by DOJ, the FTC on Feb. 4 announced that the agencies would temporarily suspend early terminations, citing an “unprecedented volume of filings” and a transition to new leadership. More than six months later, this “temporary” suspension remains in effect. Citing “capacity constraints” and a “tidal wave of merger filings,” the FTC subsequently published an Aug. 3 blog post that effectively abrogated the 30-day “green lighting” of mergers not subject to a second request. It announced that it was sending “warning letters” to firms reminding them that FTC investigations remain open after the initial 30-day period, and that “[c]ompanies that choose to proceed with transactions that have not been fully investigated are doing so at their own risk.” The FTC’s actions interject unwarranted uncertainty into merger planning and undermine the rule of law. Preventing early termination on transactions that have been approved routinely not only imposes additional costs on business; it hints that some transactions might be subject to novel theories of liability that fall outside the antitrust consensus. Perhaps more significantly, as three prominent antitrust practitioners point out, the FTC’s warning letters states that: [T]he FTC may challenge deals that “threaten to reduce competition and harm consumers, workers, and honest businesses.” Adding in harm to both “workers and honest businesses” implies that the FTC may be considering more ways that transactions can have an adverse impact other than just harm to competition and consumers [citation omitted]. Because consensus antitrust merger analysis centers on consumer welfare, not the protection of labor or business interests, any suggestion that the FTC may be extending its reach to these new areas is inconsistent with established legal principles and generates new business-planning risks. More generally, the Aug. 6 FTC “blog post could be viewed as an attempt to modify the temporal framework of the HSR Act”—in effect, an effort to displace an implicit statutory understanding in favor of an agency diktat, contrary to the rule of law. Commissioner Wilson sees the blog post as a means to keep investigations open indefinitely and, thus, an attack on the decades-old HSR framework for handling most merger reviews in an expeditious fashion (see here). Commissioner Phillips is concerned about an attempt to chill legal M&A transactions across the board, particularly unfortunate when there is no reason to conclude that particular transactions are illegal (see here). Finally, the historical record raises serious questions about the “resource constraint” justification for the FTC’s new merger review policies: Through the end of July 2021, more than 2,900 transactions were reported to the FTC. It is not clear, however, whether these record-breaking HSR filing numbers have led (or will lead) to more deals being investigated. Historically, only about 13 percent of all deals reported are investigated in some fashion, and roughly 3 percent of all deals reported receive a more thorough, substantive review through the issuance of a Second Request. Even if more deals are being reported, for the majority of transactions, the HSR process is purely administrative, raising no antitrust concerns, and, theoretically, uses few, if any, agency resources. [Citations omitted.] Proposed FTC Competition Rulemakings The new FTC leadership is strongly considering competition rulemakings. As I explained in a recent Truth on the Market post, such rulemakings would fail a cost-benefit test. They raise serious legal risks for the commission and could impose wasted resource costs on the FTC and on private parties. More significantly, they would raise two very serious economic policy concerns: First, competition rules would generate higher error costs than adjudications. Adjudications cabin error costs by allowing for case-specific analysis of likely competitive harms and procompetitive benefits. In contrast, competition rules inherently would be overbroad and would suffer from a very high rate of false positives. By characterizing certain practices as inherently anticompetitive without allowing for consideration of case-specific facts bearing on actual competitive effects, findings of rule violations inevitably would condemn some (perhaps many) efficient arrangements. Second, competition rules would undermine the rule of law and thereby reduce economic welfare. FTC-only competition rules could lead to disparate legal treatment of a firm’s business practices, depending upon whether the FTC or the U.S. Justice Department was the investigating agency. Also, economic efficiency gains could be lost due to the chilling of aggressive efficiency-seeking business arrangements in those sectors subject to rules. [Emphasis added.] In short, common law antitrust adjudication, focused on the consumer welfare standard, has done a good job of promoting a vibrant competitive economy in an efficient fashion. FTC competition rulemaking would not. Conclusion Recent FTC actions have undermined consensus antitrust-enforcement standards and have departed from established merger-review procedures with respect to seemingly uncontroversial consolidations. Those decisions have imposed costly uncertainty on the business sector and are thereby likely to disincentivize efficiency-seeking arrangements. What’s more, by implicitly rejecting consensus antitrust principles, they denigrate the primacy of the rule of law in antitrust enforcement. The FTC’s pursuit of competition rulemaking would further damage the rule of law by imposing arbitrary strictures that ignore matter-specific considerations bearing on the justifications for particular business decisions. Fortunately, these are early days in the Biden administration. The problematic initial policy decisions delineated in this comment could be reversed based on further reflection and deliberation within the commission. Chairwoman Lina Khan and her fellow Democratic commissioners would benefit by consulting more closely with Commissioners Wilson and Phillips to reach agreement on substantive and procedural enforcement policies that are better tailored to promote consumer welfare and enhance vibrant competition. Such policies would benefit the U.S. economy in a manner consistent with the rule of law.

## Cap K

### 2AC – Cap K

#### B) Neolib leads to international co-op and free trade, k2 world peace and better local policies

-empirics flow aff

-international institutes check conflict

-poverty at lowest levels in history (fre

Loeb 17 (Marc David Loeb, author for the Medium, 6/4/17, “Neoliberalism has done the most good for the most people of any economic system in human history”, Medium, <https://medium.com/@marcdloeb/neoliberalism-has-done-the-most-good-for-the-most-people-of-any-economic-system-in-human-history-9a9bd91eda4c>, Accessed 7/18/20)

**International cooperation and economic relations, cores tenants of neoliberalism, are some of the keys to world peace**. Trade between nations reduces the incentives to fight. **There has never been a war between two capitalist democracies**. International institutions such as the United Nations, World Bank and World Trade Organization provide a medium for disputes to be settled with words, not arms. **There are fewer deaths from conflict today then there has been in any other point in human history**. Free trade has one of the most assaulted neoliberal principles in recent years. Bernie Sanders asserts that trade allows American corporations to exploit poor foreigners. Donald Trump declares that it costs Americans their jobs. In fact, free trade enriches both the American poor and the global poor. A factory job in China pays 5–10 times higher wages than subsistence farming. When factories are forced to close due to new trade barriers, foreign workers end up in worse jobs “[or on the streets — and…a significant number [are] forced into prostitution.” “Because the countries are poor, even what look to us like bad jobs at bad wages are almost always much better than the alternatives.](http://www.nytimes.com/2001/04/22/opinion/reckonings-hearts-and-heads.html)” Free trade has smashed global poverty, which is at it’s lowest level in human history. Poor people in the United States benefit from trade and globalization too. Lower income people spend more of their income meeting the basic needs of life. A drop in food prices means little to rich people but a significant improvement in livelihood for poor people. **Ending free trade would disproportionately hurt poorer Americans**, and [“would cause the poorest 10% of consumers across 40 countries to lose 63% of their purchasing power.”](http://www.latimes.com/opinion/op-ed/la-oe-kirchick-neoliberalism-defense-20170604-story.html) The average American household is effectively [18,000 dollars richer](https://www.washingtonpost.com/blogs/right-turn/wp/2017/06/05/the-high-cost-of-the-anti-trade-wave/?utm_term=.85089baaedbe) than it would be without trade. Nations with freer economies and more open trade are wealthier than their closed counterparts. This is evident in broad statistical examinations of the world economy. There is a strong correlation between a nation’s combined index of [economic freedom](http://www.heritage.org/index/) (including trade, regulatory and labor freedom) and overall prosperity. **Economic liberalism can mean a lot on the smaller scale too**. Take housing for example. Cities such as Dallas and Atlanta, with freer housing markets, are far more affordable than restricted markets like New York and San Francisco. Despite spending billions on “affordable housing” [only 1 in 4 housing units are affordable to the middle class in NYC. The City Government of Dallas spends almost nothing on affordable housing yet 4/5 homes in Dallas are affordable](https://www.trulia.com/blog/trends/middle-class-may-2014/) (despite the fact that Dallas is growing far faster than New York is). No expensive US housing market allows their supply to grow at a rate in concert with demand. No expensive city builds enough housing. [Policies such as rent control, height restrictions, land use control and mandatory inclusionary housing are intended to help people (and do aid a few),](http://www.nytimes.com/2000/06/07/opinion/reckonings-a-rent-affair.html) but end up hurting far more, poor people in particular, by reducing housing supply and pushing up prices. Finally, i[n unconstrained housing markets poor people are unlikely to be displaced because of gentrification.](https://www.vox.com/2015/12/25/10660000/gentrification-economics) The Equalizer Contrary to claims by populist political candidates, economic liberalism has the potential to reduce inequality too. On the subject of housing, most of the growth of wealth inequality in the United States over the past few decades has been driven by higher housing costs. Land and property owners in New York and San Francisco have become hugely wealthy because prices have risen so rapidly. Additionally high housing costs amount to “opportunity hoarding” by the upper middle and upper class. Working class people, instead of moving to highly productive and rich cities like New York instead move to poorer and less productive cities with worse jobs, education and infrastructure, trapping them at lower income and productivity levels. Liberalizing the housing market, thereby lowering housing costs, would reduce inequality and boost growth. “Enrico Moretti and Chang-Tai Hsieh estimate that the U.S. economy would be 10 percent bigger if three cities (San Francisco, San Jose, and New York) had the zoning regulations of the median American city.” By using “data from 220 metropolitan areas [they found] that these constraints lowered aggregate US growth by more than 50% from 1964 to 2009.” **Globally inequality is down due to neoliberalism as well**. Free trade and comparative advantage have massively enriched the once impoverished nations of the world. **The gap between poor and rich countries** (**exasperated by communism** and colonialism) has closed in the past few decades.

#### C) Capitalism is the only option – solves warming and the ontological distancing of “us” and “the natural world” – tech creates exponential returns in adaptation and mitigation strategies.

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In this provocative essay, Marco Rosaire Rossi challenges Murray Bookchin's fundamental claim that capitalism's lifeblood is unfettered growth. Contrary to radical wisdom, Rossi writes, if we are to build an ecological society we will need more growth, not less. De-growth in a time of austerity is morally reprehensible and material prosperity must be increased; the Industrial Revolution must be rapidly advanced. Without this progress, humanity will only remain at the threshold of an ecological society and no more. It has become almost cliché to remark that human civilization is facing an existential crisis unparalleled in history. It is almost cliché, but not quite, because to refer to it as cliché does a disservice to the extensiveness of the problem; and yet, calling it a cliché somehow speaks to the banality of the apocalyptic cries. From across the political spectrum, there is a sense that “The End Is Nigh,” and after “Nigh” has lasted many years—for some, even decades—a sense of apathetic dread sinks in. The world is going to die, it has been dying for years, and apparently there is nothing anyone can do about it. This acedia of apathetic dread is based both in reality and in ideology. The reality is that the planet is experiencing a major threat in the form of global warming. Our global economic system has put itself in violent opposition to any ecological parameters. The major disruptions of global warming still loom over the horizon; yet, their immanence means that we need to consider the consequences of increasing humanity’s material prosperity. Billions of people need to be pulled out of poverty, but if doing so ends up sending the planet off a cliff then it makes little sense to do just that. At the same time, billions of people are living in abject poverty. Chilling ourselves to their plight out of ecological concern requires a dimming of our sense of humanity. In halting material prosperity we may save the planet but in the process we kill our humanity. Development or Sustainability? The ideological source of this apathetic dread is the Morton’s Fork between material security and ecological sustainability to begin with. Ideologically, there appears to be an inability to imagine a society that is materially secure, even prosperous, and ecologically sustainable. Finding a loving marriage between technology and ecology is at the center of many of our ecological and social problems. New technologies must allow ecosystems to become more diverse and stable, and that environmental diversity and stability must be used in such a way that it allows humans the time and leisure to engage in even more sophisticated technological pursuits. What environmentalists have failed to cultivate when it comes to nature is the same sense of progress that seems instinctual to a modernist understanding of technology, thus their opposition. Since the birth of the environmental movement the entire approach to the natural world has been one of conservation. A pristine, romantic, and often spiritual approach to the natural world has meant that environmentalists have adopted a savior psychology to their activism. Nature, in its innocence, cannot be polluted with civilization. It must be saved from the inherent capriciousness of humanity through prohibitions and austerity. This one-sided approach to environmentalism not only ignores the vitality and resilience of the natural world, but also establishes an “otherness” between humanity and nature that reinforces humanity’s alienation to the natural world. In the hopes of bringing the “arrogance of man” down to the level of nature, environmentalists have duplicated the very dichotomy that they oppose but with one important twist: Nature is supposed to reign over society, and it should reign even if the supremacy of nature means that certain people in society must be made desolate. Ecology should not, and cannot, be a synonym for misanthropy. Civilization does have the potential to destroy nature, but it also has the potential to restore and complement it. The modern world has endowed us with both unprecedented destructive capacities and liberating potentialities. Moreover, modern technology has shown us the means to not only liberate humans from the harsh conditions of the natural world, but also to liberate the natural world from a harsh and myopic civilization. Before the use of coal fed the Industrial Revolution, the main source of energy in the world was wood. Wood is an extraordinarily inefficient source of energy that releases a lot of carbon into the atmosphere. If the European need for wood had not transferred to coal—and there was no reason to suspect that it would have slowed down—then all of Europe would have been deforested, and we would still be dealing with the problem of climate change. The fossil fuel economy saved humanity from this travesty. Fossil fuels, though problematic in our own time, are far denser forms of energy. They do not require a massive project of deforestation to extract. The movement beyond fossil fuels continues along the same lines as the movement beyond wood, that is, the search for denser and more efficient forms of energy. This project can only come about through the advancement of technological and scientific progress, a furthering of the Industrial Revolution, not its retraction. Similarly, our economy is potentially going through a subtle process of dematerialization that is forcing a reassessment of the relationship between industrial and postindustrial societies. We are able to generate more wealth, with less stuff, more efficiently. In the developing world, many countries are still experiencing materializing economies, but—as the developed nations dematerializes—there appears to be a point when economic development reaches past material security and into intellectual and cultural achievements. Consumerism is to be feared when it becomes a substitute for social creativity. Consumption, in contrast, is not just metabolically necessary, but socially desirable. The sociability of a farmers’ market or craft fair indicates that there is an innate participatory aspect to consumption that goes beyond avaricious conceptions of humanity as automaton pigs with bottomless stomachs. People consume the most when they are in groups, and yet our consumption is the least material when it is the most communal. The greatest ecological transformation that the modern world has brought is the migration of people from villages to cities and the bifurcation of rural and urban life. From an ecological perspective, cities, with their geographical density and tightly interwoven economies, create an ideal situation for harmonizing the social and the natural world. Cities enable rich cultural lives and they do so at a minimum of ecological consequences. Stacking homes in apartment buildings and concentrating human activity within a walkable distance requires an intense alteration of an ecological landscape, but that landscape is extremely small, and uses a fraction of the resources used by sprawling suburbs. In turn, the movement to the cities has been matched and encouraged by startling technological innovations in agriculture. The sustainable intensification that has happened through the creation of the modern city is also happening on the modern farm. Food production has reached heights undreamed of a hundred years ago, and it has done so with a fraction of the labor power and a slowing down of the need for more land. The ability to produce more with less has meant that a feral nature has been able to bounce back. The social and the natural world are cobbling together a lasting peace within a strategic division between urban, rural, and feral landscapes. These important trends give hope to reconciling technology and ecology but they are not inevitable. Apathetic dread should not be replaced by euphoric naiveté. These trends have only developed through an effort to modernize civilization. This includes pursuing a secular and scientific worldview that values innovation and technological achievements, but it also includes expanding democratic governance, ensuring social and economic equality, and encouraging cosmopolitan perspectives. Dealing with our current ecological crisis means that we must recognize that our inability to move from fossil fuels to other sources of energy is rooted in stubborn institutional arrangements that do not respond more to the imperatives hierarchical management and market competition than human and ecological needs do. Capitalism: No friend of growth Global warming is a market failure of potentially catastrophic proportions. The carbon released into the earth’s atmosphere is externalized from the transactions within our economy, and this externalization means that the cost of this pollution is placed on future generations and the environment. The pursuit of developing nations to have a living standard on par with that of developed nations is thought to be at the heart of this market failure, but that is a misplaced analysis. Free market libertarians and Luddite eco-socialists alike have thought that economic development was a byproduct of capitalism. This assumption ignores the reality that the areas of the world that have been forced to deal with the fiercest free-market conditions are the areas of the world that have been the most chronically underdeveloped. Developing nations have only been able to shake off the yoke of imperialism through establishing planned economies, industrial policies, and social safety nets that prevent the self-destructive tendencies of markets. For decades, pioneering social ecologists such as Murray Bookchin warned environmentalists and political radicals of a coming ecological collapse initiated by capitalist modes of production. For Bookchin it was capitalism’s “grow-or-die” ethos that inexorably linked the market economy to the simplification and eventual destruction of complex life, including humanity. Bookchin got the problem right, but the causal mechanism wrong. Indeed, capitalist modes of production are at the heart of much of our current ecological problems, but it is not because capitalism inherently promotes economic growth. If there is one major lesson that should be drawn from post-World War II economic history, especially from our own globalized neoliberal era, it is that the economic growth unleashed by unfettered free markets is quite limited. Free market capitalism does not seem to operate along the lines of “grow-or-die,” but instead along the lines of “grow-then-die,” meaning that macroeconomic growth under capitalism is hindered by the same anarchic market forces that lead to its initial paroxysm. And it is the periods of economic destruction—where there are continual recessions and extreme social volatility—that pose the greatest threats to our ecology. It is in those periods when it is the most difficult for people to understand that the fate of humanity is intimately tied to the fate of the natural world, and when people are least inclined to use additional resources to explore newer, more environmentally sustainable technologies. Capitalism is at the heart of our ecological crisis not because it develops economies, but for the very fact that it does the opposite. Joseph Schumpeter’s plucking of the term “creative destruction” from Marxists has both enlightened and obfuscated our conceptual understanding of economic development and its relation to technology. For Schumpeter, largely drawing on Marxist writings on capitalism, creative destruction referred to periods of economic development where an old world was destroyed to make way for the prosperity of a new one. His meaning is more akin to the Hegelian notion Aufhebung, a concept that is always underneath Marx’s work, than to the mechanistic repetition of collapse and regeneration of the business cycle that free-market apologists have emphasized. The exogenous factor for these economic upheavals was the introduction of new technologies, ones that were able to internalize externalities, create efficiencies, and thus undermine all previous forms of competition, even monopolistic forms. Schumpeter was correct in recognizing the inherent developmental nature within economies and the important role of technological progress as in usurping a given economic order, but his willingness to attribute this progress to capitalists, specifically large corporations and monopolistic entities, clouds the actual nature of this economic development. The increasing complexity of economic transactions and technological innovation demand that those periods of creative destruction become less driven by lone inventors and more the result of collective institutions and mass social cooperation. The belief that capitalism, as an ethical framework, can save itself by its own innovation ignores the stark reality that to produce such innovation in complex modern societies capitalist ethics must be violated, sometimes violently so. Marx and Engels were correct: there is a disjunction between modes of production that require increasingly cooperative institutions and an economic system that promotes an extreme individualistic ethos above all else. But, their focus on the birth of factory labor out of feudal artisanship was myopic. Capitalism’s inconsistencies arise not only within the factory, where the cooperation of workers to produce goods is at odds with the individual ownership of the factory by capitalists, but also in society at large, where the demands for modern technological innovation require huge economies of scale and cooperation between workers in entire industries. In this way, economies have developed despite private ownership and hierarchical forms of management, not because of them. As the Solow-Swan growth model has shown, the main engine for economic growth in developed nations, at least since World War II, has been the introduction of technological innovation. In this same period, the primer for this engine has been public sector spending. It is the public sector that has played the most critical role in economic development through planning economies and allocating resources toward research and development. Unfortunately, the public, disengaged from their political institutions by a sprawling hierarchical class of bureaucrats and professional politicians, have allowed a parasitic private sector to profit from this innovation and to direct this allocation in a manner that best serves them. Regardless though, modern capitalist prosperity has only been able to occur through shadow socialism. The irony of all modern entrepreneurs is that none of them would have been able to innovate without the aid of the state. Socialism, democracy and equality The question then beckons: why should socialism remain in the shadows? What is needed to deal with the crisis of global warming is not policies of planned economic de-growth that mimic rightwing austerity under a socialists facade, but rapid and sustainable economic growth through embracing technological innovations that reconcile the tension between society and nature. A great confusion has overcome both the acolytes and adversaries of capitalism. “Capitalism” as a particular mode of production has become so synonymous with economics in general that any economic growth is seen as capitalist economic growth, regardless of its context or results. In actuality, capitalism is an example of an alienated economy where the vast majority of its participants—that is to say, workers and consumers—are unaware of their true economic potential. The ultimate form of “creative destruction” regarding capitalism is the technological and economic development out of capitalism itself. The humanist desire for continuous and sustainable economic development, the constant pursuit for ecologically sound and cooperative forms of production and consumption is a threat to capitalism, not the apex of its expression. Polemical calls for economic de-growth in a world where the majority of people still live in abject poverty are worse than strategically inep

t; they are morally reprehensible and politically asphyxiating. Democracy, especially sophisticated forms of direct democracy, cannot advance without increasing material prosperity. Since the time of Aristotle, it has been recognized that for democracy to function there must be a degree of leisure time spent among the population. No robust public life can be established in a society where material scarcity causes people to devote the majority of their time to securing the fundamental means of subsistence. Further, a society where technologies have reduced, and in some cases eliminated, odious tasks liberates people to engage in higher cultural functions, including their own self-management and governance. This is especially the case for those who have been traditionally denied access to the public sphere. Despite its necessity for its time, the eighteenth-century cry that “we are all born equal” has become an ossified platitude. The reality is that we are not all born equal. Nature produces grave inequalities between us in ability. Morality demands that we rectify these inequalities by creating new opportunities, both socially and materially, for all. There is a dialectical relation between social equality and technological innovation. Modern feminism would have an entirely different meaning if breakthroughs in contraceptive technologies were not established by the mid-twentieth century. The case is similar for the elderly, for transgender individuals, for people with disabilities, children, and nations established in areas of the world with a dearth of natural resources. In each situation, the interaction between social struggles and technological innovations has led to greater social inclusion. People are not born equal, rather, they are perpetually made and remade equal by continuous efforts at social uplift and prosperity. Conclusion There is no reason to doubt that such “equalizing” efforts could not only continue but be advanced into the ecological realm. Modern technologies and the growth of material prosperity have within them the potential to “uplift” the environment. Far from being a matter of mere conservation, environmental sustainability in the modern world is a twin-cousin to development economics. Influenced by the work of soft deep ecologists such as Bill McKibben, many environmentalists have lamented the “end of nature” and arrival of the Anthropocene, fearing that it signifies the beginning of the end for biodiversity. No doubt, the Anthropocene has this potential, but it also has another potential. Through modeling its environment to ensure human prosperity while at the same time organizing its social institutions to guarantee environmental stewardship, humanity has a historical opportunity that is unprecedented among any species on that planet. Humanity can escape its Malthusian traps through continually enriching, rather than simplifying, it surrounding environment. Its flourishing as a species could be a boon for biodiversity rather than its dwindling. There needs to be a conscious social reconfiguration that utilizes denser forms of energy, dematerializes economies, and geographically decouples humanity from nature within a triad of urban, rural, and feral development. If such a reconfiguration where to occur it would mean a massive expansion of economic growth through the unleashing of humanity’s technological and scientific potential. The complexity of such a project can only happen through the type of large participatory planned economy that socialists have always advocated for. All capitalists have a vested interest in protecting their business model, even if such a model is based on an obsolete technology that is destroying the planet. The only way societal development can avoid getting bogged down in the obstinateinterests of capitalists is if economic interests become the general interest of all. That is only possible in a democratic economic system that values the participation and perspective of each individual, in community, instead of the will of one class over another

#### D) Growth is sustainable and awesome---robust environmental progress and increasing resource reserves prove

Andrew McAfee 20, principal research scientist at MIT, codirector of the MIT Initiative on the Digital Economy at the MIT Sloan School of Management, Doctorate from Harvard Business School, two Master of Science and two Bachelor of Science degrees from MIT, "Don't Misunderstand Earth Day's Successes," Wired, 4-22-2020, <https://www.wired.com/story/opinion-dont-misunderstand-earth-days-successes/>

We should all be intensely grateful to the people who took to the streets exactly 50 years ago on the first Earth Day. The modern environmental movement that crystallized then has given us a cleaner, better planet. The pressure applied to governments and businesses on April 22, 1970, has not let up since, and it has yielded two huge victories.

The first is massive reductions in the amount of pollution we and our ecosystems have to endure. In the world’s richest countries, which are the ones where environmentalism has most taken hold, the air, land, and water are all much cleaner than they were 50 years ago. This is not because these countries have simply offshored degradation to poor nations. Germany, for example, has the world’s largest trade surplus, yet has seen steady reductions in air pollution in recent decades.

If globalization is not the reason rich countries are much cleaner now than they were half a century ago, then what is? Effective regulation. The United States established the EPA and greatly strengthened the Clean Air Act in 1970, added the Clean Water Act in 1972, and kept taking steps over the years to bring down all kinds of pollution.

Some of the most innovative and helpful of these steps are cap-and-trade systems that create markets for pollution. Companies can trade with each other for the right to pollute, but the overall total is set by the government and declines over time. Over the past 30 years cap-and-trade has proved to be both relatively cheap and highly effective; a triumph of smart environmentalism.

The other great triumph is the improved health of species and ecosystems that we had pushed to the brink. Throughout the 20th century, relentless hunting almost wiped out whales. A nearly global moratorium was finally passed 1982, thanks in part to the “Save the Whales” movement that started in the mid-1970s (no doubt helped by folk superstar Judy Collins’ 1970 hit “Farewell to Tarwathie,” which introduced many people to whales’ haunting songs).

Many other species, including wolves, bears, beavers, and deer, have also come back after being near extinction in America. They rebounded in large part because we limited when, where, and how they could be hunted, and we limited trade in wild animal products. It’s generally illegal, for example, to sell hunted meat in the US. For the past 50 years, the environmental movement has carried on the laudable traditions of conservationism, which got its start early in the 20th century as Americans reacted in shock and horror to the extinction of the passenger pigeon and near elimination of the bison and other iconic animals.

Paradoxically, the great victories over pollution and extinction highlight environmentalism’s greatest weakness: a continued hostility to economic growth. The “degrowth” movement, which started in the early 1970s, stressed that human populations and economies simply couldn’t continue to grow as they had in the decades leading up to Earth Day. As philosopher André Gorz put it in 1975, “Even at zero growth, the continued consumption of scarce resources will inevitably result in exhausting them completely. The point is not to refrain from consuming more and more, but to consume less and less—there is no other way of conserving the available reserves for future generations.”

This seemed like an obvious truth to many in the 1970s, especially when they saw that the use of many natural resources—fossil fuels, metals and minerals, fertilizer, and so on—had been increasing in lockstep with the size of the overall economy. Since these resources were finite, and since their consumption went hand-in-hand with growth, growth apparently had to stop.

Yet around the world, it didn’t. The pace has slowed down a bit since the inaugural Earth Day, but this is mainly because the years between 1945 and 1970 saw exceptionally fast growth as we rebuilt our societies after two world wars. Except for that 25-year stretch, economic growth since 1970 is the fastest the world has ever seen.

So how are natural resource stocks doing? Oil is a great indicator of the overall story (its recent pandemic-induced demand free fall notwithstanding). At present we have about 50 years of oil left, given projected consumption and known reserves. That sounds dire, until you realize that 40 years ago, we only had 30 years of oil left. How can this be? It’s certainly not because we’ve cut way back on oil demand; we consume almost 40 percent more oil now than we did in 1980.

It’s because we kept finding more supplies. The same is true for every other economically important natural resource. Proven reserves—the amount of the resource we know we can access—have increased as we keep developing better technologies for finding and accessing them. And because the supply-demand balance keeps getting more favorable, resource affordability increases. The world’s average worker can, with an hour of their labor, purchase a greater quantity of every important resource than was the case just a few decades ago.

We live on a finite planet, but an incredibly abundant one. It contains enough of everything we need for as long as we’ll be around. Especially since, in the decades and centuries to come, we clever humans will almost certainly figure out nuclear fusion or some other technology that gives us limitless clean energy and lets us ignore fossil fuels. In short, there’s no need to slam the brakes on our growth. This happy fact is deeply counterintuitive, and it trips a lot of people up. But the evidence is clear: Degrowth is unnecessary.

In fact, it’s a terrible idea. Recall that the countries that have cleaned up their environments the most since Earth Day are the richest ones. This is not a coincidence, as Indira Gandhi knew in 1972. In a speech given in Stockholm, she said “Are not poverty and need the greatest polluters?... The environment cannot be improved in conditions of poverty.” Prosperous people and societies can afford, in every sense of the word, to care about the state of the planet we all live on, and to improve it.

Economic growth does not irreversibly degrade and deplete the planet. Instead, economic growth yields more prosperous people, who demand to live in a better world—a world with less pollution and more healthy ecosystems. The 50 years since Earth Day have largely shown that they get what they want.

The Covid-19 recession has given us much cleaner air in cities around the world, but at a terrible cost. We don’t need to endure such hardship to reduce emissions from car traffic. If we just made pollution more expensive and energy and transport innovation cheaper (via subsidies or research funding), we’d get the same clean skies without any economic devastation at all.

We face no shortage of environmental challenges over the next 50 years. We continue to overhunt, overfish, and raze ecosystems in many parts of the world. More extinctions loom. And of course we have to reduce the greenhouse gas pollution that’s causing global warming. The good news is that, in the decades since Earth Day, we’ve put together an effective playbook for meeting these challenges. I hope the environmentalists of the coming half-century will study this playbook, and realize that it shuns degrowth rather than advocating it.

#### Alt fails: Undoing squo power relations requires attacking power structures through pragmatic struggle – critical inquires are ineffective.

Zack 17

Naomi Professor of philosophy at the University of Oregon. 02/2017. “Ideal, Nonideal, and Empirical Theories of Social Justice: The Need for Applicative Justice in Addressing Injustice.” The Oxford Handbook of Philosophy and Race, Oxford University Press.

*Ideals* **of justice may do** *little toward the correction of injustice in real life*. The influence of John **Rawls**’s A Theory of Justice **has led some philosophers of race to focus on “nonideal theory” as a way to bring conditions in unjust societies closer to conditions of justice described by ideal theory**. **However, a** *more direct approach to injustice* **may be needed to** *address unfair public policy* **and** *existing conditions for minorities in racist societies*. Applicative justice describes the applications of principles of justice that are now “good enough” for whites to nonwhites (based on prior comparisons of how whites and nonwhites are treated). Social information just dribbles in, bit by bit, and we simply get used to it. A single story about a person really hits home at once, but the grinding injustices of daily life are endured. It is easy to ignore them and we do. Judith Shklar, The Faces of Injustice (Shklar 1990, 110) IDEAL theory about justice extends from Plato’s Republic to John Rawls’s A Theory of Justice, including many careers devoted to analyses and criticism about such texts in political philosophy. Rawls offers a picture of the basic institutional structures of a just society, on the premise that in order to correct injustice, we must first know what justice is. According to Rawls, while “partial compliance theory” studies the principles that govern how we are to deal with injustice, full compliance theory, or ideal theory, studies the institutional principles of justice in a stable society where citizens obey the law. Rawls began A Theory of Justice with the claim: “The reason for beginning with ideal theory is that it provides, I believe, the only basis for the systematic grasp of these more pressing problems” (Rawls 1971, 8). Rawls’s **ideal theory is too abstract to correct injustice or provide justice for victims of injustice in reality, because it is based on a** *thought experiment* **and the** *assumption of a “well-ordered” society* **in which there already is compliance with law** (Zack 2016, 1–64). **What people care about in reality concerning justice is not what ideal justice is or would be, but how immediate injustice can be corrected**. **Injustice is always** *specific in concrete events* **that are recognizable as** *certain types*, **for example, theft, murder, or police racial profiling.** *Injustice can be corrected by punishing those responsible* for it **in specific cases and** *instituting social changes that prevent or reduce future occurrences of the same type*. Rawlsian **nonideal theories of justice**, constructed for societies where people do not comply with just laws, **rely on ideal theory as a standard for just institutional structures**. The main question driving nonideal theory is how to construct a model or picture of justice that will result in the future correction or avoidance of present injustices. John Simmons quotes John Rawls from Law of Peoples, on this matter. **Nonideal theory asks how this long-term goal might be achieved, or worked toward, usually in gradual steps**. It looks for courses of action that are morally permissible and politically possible as well as likely to be effective [LOP p. 89]. (Simmons 2010, 7) **However, injured or indignant parties** *may not care about the long-term goal of justice* **that could lead to balance or compensation for their situations**. Not only are what P. F. Strawson (1962) called “reactive attitudes,” such as moral indignation, blame, and a desire for deserved punishment, strong in their focus on injustice, but the best theory of justice in the world does not tell us what to do about the injustices we are faced with in the here and now, especially “the more pressing problems” of race-related injustices. Such questions cannot be answered with reference to ideal theory or some application of ideal or nonideal theory to their concrete situations, because the a priori nature of both of these does not provide a fit with specific contingencies—ideal and nonideal theories do not generate practical bridge principles. As theories, they posit ideal entities, but without the apparatus of scientific theories which provides connections to observable entities or events. (Moulines 1985). The correction of injustice or injustice theory requires a philosophical foundation for itself. Models of justice have often been naïvely utopian throughout the history of philosophy, because they are based on an assumption of automatic total compliance, as though the right words or pictures by themselves have the power to transform reality, or as though agreement with those right words or pictures will automatically result in action that will automatically make the world instantiate those words or pictures. When they are not fantastically and ineffectively utopian in this way, such models have been used to justify the already-existing dominance of some groups over others. (A prime example is John Locke’s Second Treatise of Government, written decades before 1688 Glorious Revolution, to express the interests of the new rising class of landed gentry, which were eventually fulfilled by a Protestant king on the throne and a strong representative parliament after that revolution [Laslett 1988].) Models of justice have legitimately served to inspire law in modern societies with government constitutions and national and local law. But, sometimes, as in US founding documents, although universal and absolute justice is proclaimed, subsequent events make it clear that this language was intended to legitimize just treatment for members of selected groups only, that is, white male property owners, at first. As a result of just law and its selective application, over time, there comes to be justice for an expanding group, but still not everyone in society. However, what is written, together with descriptions of real justice for some, can be a powerful lever for obtaining justice for at least some of the excluded. To understand how that works, it is necessary to develop an approach to justice that begins with injustice, in real situations where there is already some degree of justice in a larger whole. The extension of existing practices of justice to members of new groups is applicative justice, a concept with substantial historical and intellectual precedent, although not by that name. In what follows, more will be said about the idea of applicative justice and then its history will be considered. Voting rights and housing rights are examples of candidates for applicative justice in our time. Finally, content in the form of narrative may be motivational for social change. The Idea of Applicative Justice Applicative justice is an approach to justice with the goal of making the unjust treatment of some comparable to those who already receive just treatment. Applicative justice takes a comparative approach, for example, comparing how young black males are treated by police officers in contemporary US society, to how young white males are treated (Jones 2013; Zack 2013, 2015). Applicative justice rests on a pragmatic approach to social ills, which includes the premise, based on Arthur Bentley’s 1908 insights in The Process of Government, that government is much more than the apparatus of state and written laws and court decisions. Government is an extended, dynamic process, an ongoing contention among interest groups in society. This full-bodied, empirical and pragmatic view of government process entails, for example, that we consider as parts of the same political mix/phenomenon/raw material all of the foregoing: the Fourth and Fourteenth Amendments, the 1960s Civil Rights Legislation, doctrines of probable cause, the disproportionate incarceration of African Americans, racial profiling, and police homicide with impunity. Thus, Rawls’s insistence that “the rights secured by justice are not subject to political bargaining or to the calculus of social interests” (Rawls 1971, 4), should be understood as “the rights secured by justice should not be subject to political bargaining or to the calculus of social interests.” **In reality, “the rights secured by justice” are constantly subject to political bargaining and the living calculus of social interests**

**.** *One consequence of this empirical perspective is that moral outrage, critiques of white supremacy, or analyses of white privilege, along with other forms of blame, cannot be assumed to have the power to change anything, by themselves*. **By contrast, changing relationships between police officers and their local communities, or changing the** *rules of engagement*

 when police stop or attempt to stop suspects, *might* on this view **have some** *causal power* (Ayres and Markovits 2014). **It is important to realize that such changes in practice would not be specific applications of a theory of justice, but ways of changing social reality into a different political mix.** However, a better theory of justice, even a more racially egalitarian one and even a theory of applicative justice that was widely accepted, would still be no more than a change in what Bentley calls “political content.” Any theory of justice or any set of just laws is compatible with widespread racially unequal and unjust practice. And the converse also holds. **Unjust laws or laws with gaps** for unjust practice **are** *compatible with just practice*. **Thus,** *applicative justice is pragmatic* **in taking the** *whole political mix*/ phenomenon/raw material **as its subject for a specific injustice**. Unlike ideal or nonideal justice theory, **the applicative justice approach brooks** *little faith* **that** *reality can be changed by a special conceptual space or mode of critical moral discourse* **that is undertaken apart from reality. Reality** *cannot be changed by normative pronouncements, by or on behalf of the oppressed*, **but only by shifts in existing interests of groups of real people. To base hopes for change on normative content alone may** ~~paralyze~~ **[eliminate] the means for taking action that could result in change, because such content proceeds as though matters of justice were only matters of argument**. **Those who have opposed social racial justice have understood this well enough, because instead of mainly arguing against new just law** over the twentieth century, **they have taken action to block progress.** Race and Justice Consideration of race and injustice together, within political philosophy, focuses on the need for specific groups to not be treated unjustly. For a group to be treated justly, a large number of its members need to be treated justly. But for a group to be treated unjustly, it is sufficient if a smaller number or lower proportion than required to meet the standard of just treatment be treated unjustly. One reason for this asymmetry is that just treatment is easily normalized within communities, whereas unjust treatment of only a few is disruptive and considered abnormal among other members of the group to which victims belong (although not necessarily by members of groups who are generally treated justly). The unjust treatment of a small number ripples from their friends and relations to other members of the same group, who realize that they are subject to similar unjust treatment from their membership in that group alone. More broadly, if the group treated justly and the group treated unjustly belong to the same larger collective, such as whites and blacks in the United States, then the unjust treatment of even a very small number of that total collective of residents or citizens should be disruptive to the whole collective, given promulgated principles of “justice for all.” But that does not always happen, at least not in ways that result in real change. Apathy and self-absorption of those not treated unjustly is part of the reason, although another significant part is that the group treated justly already knows that the national collective rhetoric of justice is intended to apply primarily to them. It is that kind of disparate treatment, which does not disrupt everyone, even though it should, which calls for a theory of applicative justice, on the abstract level where people call for justice. But applicative justice is not only an abstract theory. Applicative justice requires comparisons of group treatment. If minorities are treated unjustly, a description of that injustice does not require an ideal or nonideal theory or model of justice, but simply a comparison with how the majority is treated. (The term “minorities” refers to those disadvantaged or oppressed, because sometimes minorities are greater in number than “majorities,” e.g., blacks under apartheid in South Africa, American slaves in some Southern states, or black Americans in some twenty-first-century cities.) The principles and mechanics of justice that work well enough for most white Americans need to be applied to nonwhite Americans. For rhetorical purposes, it might be evocative to talk about black lives or black rights, but strictly speaking the subject is a racial framework that is color-blind in an important part of law—constitutional amendments and federal legislation—but not in reality. This gap between written law and social reality can be viewed as hypocrisy, racial bias, or white supremacy, only if one assumes that written law is an accurate description of, or blueprint for, social reality. But a perspective that takes in the whole process of government reveals that the gap and what is permissible within it, are parts of the same whole process. The contrast between blueprints and maps is important to consider. Political philosophers often proceed as though their writings about justice are blueprints, when they should instead begin by constructing maps. Present politics or a political party in power may present obstacles and challenges to applicative justice in any specific case. Those who aim for applicative justice must struggle against such obstacles and challenges, as well as the ignorance, prejudice, and ill will of large parts of voting publics under democratic government, and in addition, media misrepresentations, business interests in a status quo, and lack of understanding of oppression by those who are treated unjustly. For example, the injustice in the disproportionately large number of African Americans in the US criminal justice system has been supported by law-and-order politics, the War on Drugs, belief in racial gender myths (e.g., the larger-than-life black rapist), explicit racism, media sensationalism of crime committed by black men, profits made by for-profit prison corporations, and embrace of self-destructive subcultures by some black men who become incarcerated. At the same time, as an efficient cause or precipitating factor, ongoing racial profiling by police helps feed the system with new suspects, about 90 percent of whom plead guilty in preference to the risks and costs of a trial (Kerby 2013; Rakoff et al. 2014). Intergenerational poverty, unemployment, and undereducation contain people within this system, and the high rates of nonwhites in the prison population are used as official justification for racial profiling (Zack 2015, chap 2). Thus, **the complexity of causes and background factors associated with the disproportionate number of African American male prison inmates can be understood through a** *number of approaches*. **The** *normative approach of applicative justice* **would be to address those causes or factors,** *distinctly and individually, through specific changes in concrete practice, as well as changes in law, as relevant*.

## Japan DA

### 2AC---Top

#### Extra-territorial application is a global norm---Japan’s expanding their own antitrust laws

Murray 17, Sean---J.D., 2017, and Stein Scholar, Fordham University School of Law; B.A., 2010, Vassar College (“With a Little Help from my Friends: How a US Judicial International Comity Balancing Test Can Foster Global Antitrust Redress,” Fordham International Law Journal, vol 41, no 1)

Globally, major antitrust jurisdictions have agreed protection is best attained through cross-border application of domestic laws. The EC established extraterritorial application of the EEC Treaty Article 85 (now TFEU 101), Sherman Act Section 1’s counterpart, in its 1988 Woodpulp decision.68 There, the EC decided it was necessary to extend jurisdiction over a cartel of producers located outside the European Union to avoid affording offenders of EU competition law “an easy means of evading those prohibitions.”69 Apart from the United States and the European Union, a number of other jurisdictions have also extended the reach of their own antitrust laws, including Austria, Belgium, Canada, China, Denmark, Finland, France, Germany, Greece, Japan, Luxembourg, Norway, Portugal, Spain, Sweden, and Switzerland.70

Protection under antitrust law is principally realized through deterrence and redress objectives.71 Deterring anticompetitive conduct is achieved through criminalizing conduct and allowing for the recovery of treble damages in private litigation.72 In regard to private litigation, supporters of extraterritorial application highlight the powerful deterrent effect of treble damage recovery in removing the ability of international cartelists to subsidize US operations through foreign cartel profits even in the face of domestic liability.73

#### Non-unique and no internal link---1NC Kojima just says that current antitrust is messing up Japan and that Japan didn’t agree with the US’ application of antitrust extraterritorially---it does not make a spillover or backlash arg that Japan would end economic relations over one antitrust law---at worst, their ev says other nations enacted “blocking legislation,” which does not escalate to *broader* relations

#### Japan prioritizes its economic relations with China---US-Japan alliance won’t solve

Harris 21, Tobias---Senior Fellow for Asia at the Center for American Progress (“The Surprising Strength of Chinese-Japanese Ties,” Foreign Affairs, May 4, 2021, accessed Sept 17, 2021, https://www.foreignaffairs.com/articles/china/2021-05-04/surprising-strength-chinese-japanese-ties)

Trade with China has been an important source of growth for Japan over the past two decades as the Japanese government has struggled to reinvigorate the economy. China has not just been a major market for Japanese products; it has also sent more tourists, students, and workers to Japan than has any other country. Chinese nationals form more than a quarter of Japan’s growing foreign-born population and account for nearly 40 percent of all foreign-born students. All of these trends accelerated under Abe as he opened Japan’s once sheltered economy to flows of goods, capital, and people.

Powerful political and economic actors have supported these growing ties, and none more than Japan’s business community, which has consistently stressed the need to defuse antagonism between the two countries through public appeals for diplomacy and quieter outreach to lawmakers and government officials. The business community has relied on allies in the ruling Liberal Democratic Party, which, although conservative, has historically been divided between a hawkish, anti-China wing and a more mercantilist wing. Under Abe, the mercantilists who favored better relations with China gained the upper hand. Komeito, a Buddhist party that has been the LDP’s coalition partner for more than two decades, has also long advocated friendship with China. Bureaucrats in important ministries, including the Ministry of Foreign Affairs and the Ministry of Economy, Trade, and Industry, have further urged cooperation and resisted confrontation with China.

Together, these entities have formed a kind of China lobby in Japan that has worked to insulate the bilateral relationship from political opposition. For example, politicians and diplomats argued against sanctions after the Tiananmen massacre in 1989. The business community and its political allies insisted on deepening economic integration between the two countries even in moments of heightened political tension—as occurred when Japanese prime ministers visited Tokyo’s Yasukuni Shrine to honor Japan’s war dead, a symbolic act that China considers tantamount to celebrating Japanese atrocities during World War II. Most recently, this constellation of interests, spearheaded by LDP Secretary-General Toshihiro Nikai and certain advisers in the Trade Ministry, convinced Abe to prioritize stable relations with Beijing even as the administration of then U.S. President Donald Trump embarked on a trade war with China. The tangible achievements of this effort were limited; the two governments resumed high-level leadership dialogues and inked some agreements on economic and financial cooperation. But Abe’s outreach indicated that Tokyo was trying to insulate its economic relationship with Beijing from geopolitical tensions even as voices in Washington began calling for decoupling with China.

UP FOR GRABS

In recent years, Japan’s China lobby has had to jockey for influence with hawkish lawmakers, who see China predominantly as a military threat. The Japanese public, too, has been especially skeptical of China since Beijing began asserting its claims to the disputed Senkaku (known in China as the Diaoyu) Islands in the East China Sea. According to an annual poll of the attitudes that Chinese and Japanese people hold toward the other country conducted by the Japanese think tank Genron NPO, Japanese have grown significantly more hostile toward China; more than 75 percent of Japanese surveyed every year since 2011 held negative attitudes toward China, a figure that has remained at around 90 percent since reaching a high of 93 percent in 2014. In 2020, many in Japan sounded the alarm about China’s controversial new national security law for Hong Kong, its economic pressure campaign against Australia, and the increased tempo of its military and coast guard activities in the Taiwan Strait and the East China and South China Seas.

The conditions that had enabled rapprochement under Abe had evaporated. Japan’s China hawks, sidelined while the Abe administration was in extensive talks with Beijing, quickly mobilized, petitioning the government to cancel Xi’s state visit, which had been postponed indefinitely because of the pandemic. Other groups critical of closer ties with China would follow suit, including the Japan Parliamentary Alliance on China (the local arm of the global Inter-Parliamentary Alliance on China that seeks to organize democracies in broad resistance to China) and a new parliamentary league calling for a stronger response to China’s repression of the Uyghurs in Xinjiang.

The joint statement with the United States is only the latest sign that Suga, who succeeded Abe as prime minister last September, will not revert to his predecessor’s warm diplomacy with China. Although he retained the conciliatory Nikai as the LDP’s secretary-general, Suga also appointed as defense minister Nobuo Kishi, who had acted as a personal envoy to Taiwan for Abe, his older brother. Suga has expanded a program introduced last year to subsidize Japanese companies that want to shift production out of China. He has embraced the Quad—the informal grouping of democracies that includes Australia, India, Japan, and the United States—by hosting a meeting of its foreign ministers in October and pushing for a virtual summit that was held in March. His cabinet ministers have openly protested China’s new coast guard law, which clarifies when the Chinese coast guard can use force and could allow Beijing to strengthen its claims to disputed islands. More recently, U.S. and Japanese defense officials have affirmed that the allies would cooperate in the event of a conflict between China and Taiwan.

The Japanese people continue to believe that the relationship with China is important.

But Japan’s China policy is still up for grabs. China’s aggression in the region has given hawks in Japan the upper hand for the time being, but their ascendance is hardly irreversible. Corporate Japan, for example, continues to treat China as an indispensable market. In recent weeks, leading Japanese companies, including Toyota and robot maker Fanuc, have announced significant new investments in China. Japanese manufacturers of key components for computer chips have also announced new moves into China, seeing an opportunity to gain larger market share in the wake of the U.S.-Chinese trade war. These interests—as well as those of domestic businesses that benefit from Chinese tourism—will always encourage politicians to push for stable relations with China, even if the LDP is more skeptical of China and less mercantilist than it was under Abe.

Perhaps most important, the Japanese people continue to believe that the relationship with China is important and worth maintaining. Many Japanese claim that their country has no choice but to find a way to work with its giant neighbor and economic partner, despite the genuine risks that Chinese actions pose. Genron NPO’s latest poll of Japanese and Chinese attitudes shows that despite nearly 90 percent of Japanese reporting negative attitudes about China, more than two-thirds of Japanese see economic cooperation with China as important for their country’s future. Other polls find little support for greater defense spending or for a more expansive role for Japan’s Self-Defense Forces.

#### Err aff---their link and uniqueness ev is from almost two decades ago---obviously, global norms around antitrust regulation and application have massively changed since then---numerous cases like Morrison v National Australia Bank proves presumption against extraterritoriality in recent years

#### Japan will cooperate on antitrust regulations---big tech proves

Kihara and Wada 20, Leika and Takahiko---reporters for Reuters (“Japan to join forces with U.S., Europe in regulating Big Tech firms: antitrust watchdog head,” Reuters, Oct 19, 2020, accessed Sept 17, 2021, https://www.reuters.com/article/us-japan-economy-ftc/japan-to-join-forces-with-u-s-europe-in-regulating-big-tech-firms-antitrust-watchdog-head-idUSKBN2740DZ)

TOKYO (Reuters) - Japan will join forces with the United States and Europe to take on any market abuses by the four Big Tech companies, the new head of its antitrust watchdog said on Monday, a sign Tokyo will join global efforts to regulate digital platform operators.

Kazuyuki Furuya, chairman of Japan's Fair Trade Commission (FTC), also said Tokyo could open a probe into any merger or business tie-up involving fitness tracker maker Fitbit FIT.N if the size of such deals are big enough.

“If the size of any merger or business-tie up is big, we can launch an anti-monopoly investigation into the buyer’s process of acquiring a start-up (like Fitbit),” he told Reuters. “We’re closely watching developments including in Europe.”

EU antitrust regulators in August launched an investigation into a $2.1 billion deal by Alphabet GOOGL.O unit Google's bid to buy Fitbit that aimed to take on Apple AAPL.O and Samsung 005930.KS in the wearable technology market.

Japan is laying the groundwork to regulate platform operators. Among them are big tech giants dubbed "GAFA" - Google, Apple, Amazon AMZN.O and Facebook FB.O - that face various antitrust probes in western nations.

Multi-national companies like GAFA have similar business practices across the globe, which makes global coordination crucial, Furuya said.

“We’ll work closely with our U.S. and European counterparts, and respond if to any moves that hamper competition,” he said.

## DOJ DA

### 2AC DOJ DA

#### Unregulated monopolization decimates the DIB

Ganesh Sitaraman 2020, Ganesh Sitaraman is Chancellor Faculty Fellow and Professor of Law at Vanderbilt Law School and Director of its Program in Law and Government. Sitaraman’s current research addresses issues in constitutional, administrative, and foreign relations law. From 2011 to 2013, while on leave from Vanderbilt, he served as Elizabeth Warren’s Policy Director during her campaign for the Senate, and then as her Senior Counsel in office, 2020 “The National Security Case for Breaking Up Big Tech”, Knight First Amendment Institute at Columbia University

Concentration in the tech sector also threatens the defense industrial base due to higher costs, lower quality, less innovation, and even corruption and fraud.71 Each of these dynamics has already been a problem for America’s over-consolidated defense industrial base. As technology becomes more and more central to defense and national security, it is likely that these same dynamics will replicate themselves with big tech companies. This will become a national security threat, both directly, in terms of the quality and speed of procurement, and indirectly, by reducing innovation and functionally redirecting defense budgets from research spending to higher monopoly profits.72

Conventional economic theory suggests that monopolists have the ability to increase prices and reduce quality because consumers are captive.73 When it comes to defense spending, the Government Accountability Office commented in 2019 that “competition is the cornerstone of a sound acquisition process and a critical tool for achieving the best return on investment for taxpayers.”74 At the same time, the GAO observed that “portfolio-wide cost growth has occurred in an environment where awards are often made without full and open competition.”75 Indeed, it found that 67 percent of 183 major weapons systems contracts had no compe-tition and almost half of contracts went to a handful of firms. Of course, consolidation also means that the Defense Department is in a symbiotic relationship with these big contractors. Some startup executives wanting to sell to the government thus see the Pentagon as “a bad customer, one that is heavily skewed in favor of larger, traditional players,” and they don’t feel like they can break into the sector.76

Standard stories about political economy and capture also suggest that these firms will have outsized power over government.77 As Frank Kendall, the former head of acquisitions at the Pentagon, has said, “With size comes power, and the department’s experience with large defense contractors is that they are not hesitant to use this power for corporate advantage.”78 In the defense context, that means monopolists retain power (and profits), even if they overcharge taxpayers and risk the safety of military personnel in the field.

In an important article in The American Conservative on concentration in the defense sector, researchers Matt Stoller and Lucas Kunce argue that contractors with de facto monopoly at the heart of their business models threaten national security. They write that one such contractor, TransDigm, buys up companies that supply the government with rare but essential airline parts and then hike up the prices, effectively holding the government “hostage.”79 They also point to L3, a defense contractor that had ambitions to be a “Home Depot” for the Pentagon, as its former CEO put it. L3’s de facto monopoly over certain products, according to Stoller and Kunce, means that it continues to receive lucrative government contracts, even after admitting in 2015 that it knowingly supplied defective weapons sights to U.S. forces.80

Consolidation also threatens U.S. defense capacity. The decline of competition, according to a 2019 Pentagon report, leaves the military vulnerable to “sole source suppliers, capacity shortfalls, a lack of competition, a lack of workforce skills, and unstable demand.”81 With a limited number of producers, there is less talent and knowhow available in the country if there is a need to build capacity rapidly.82 In 2018, the Defense Department released a report on vulnerable items in the military supply chain, including numerous items in which only one or two domestic companies (and, in some cases, zero domestic companies) produced the essential goods.83

How did the United States lose so much of its industrial base? The combination of consolidation and global integration is part of the story. As Stoller and Kunce argue, companies consolidated in the 1980s and 1990s while shifting emphasis from production and R&D to Wall Street-demanded profits. Globalization then allowed them to shift production overseas at a lower cost. The result was to gut America’s domestic industrial base—and, in many cases, to shift it to China, which engaged in a decades-long strategic plan to develop its own industrial base. The result, in the words of the 2018 Defense Department report, is that “China is the single or sole supplier for a number of specialty chemicals used in munitions and missiles.” In other areas too, the risks of losing access to critical resources are real. Describing the problem of limited carbon fiber sources, the same Pentagon report notes, “[a] sudden and catastrophic loss of supply would disrupt DoD missile, satellite, space launch, and other defense manufacturing programs. In many cases, there are no substitutes readily available.”84

#### No Russia war

Trenin 18 ― Dmitri Trenin, director of the Carnegie Moscow Center, Ph.D. from the Institute of the USA and Canada, Russian Academy of Sciences, Chair of the Foreign and Security Policy Program at the Carnegie Center, 2018. (“Fears of World War III are overblown”, Politico, July 20th, 2018, Available Online at: <https://www.politico.eu/article/donald-trump-vladimir-putin-nato-crimea-fears-of-world-war-iii-are-overblown/> Accessed 11-13-2018)

As for Russia’s own intentions, two things are clear. There is no interest in Moscow in attacking the Baltic states or Poland. These countries are as safe now as they were before 2014. Suggestions otherwise simply point to the deep wounds in both nations’ psyche, which will not be healed for many decades.

Should Ukraine’s leaders decide to repeat Mikheil Saakashvili’s mistake in 2008 and launch a major offensive to retake Donbas — however unlikely — the Russian response could indeed be devastating and lead to Ukraine’s loss of sovereignty, as Putin recently stated. But does this mean Russia will move on Ukraine unprovoked? Most certainly not.

Putin’s main concerns are largely domestic. He has an ambitious program that logically calls for more economic ties with the West. To move forward, he is looking to ease tensions with the EU and the U.S. What Putin wanted to get out of Helsinki was mainly to start a dialogue with Washington.

Those hopes are now visibly going up in smoke. It is safe to bet that Russia will continue to face the same opposition from a coalition of U.S. and EU interests.

The first détente in the hybrid war between Russia and the West was indeed nipped in the bud by Trump’s behavior and the vehemence of his domestic critics. So be it.

Moscow will not capitulate, and will indeed push back. But it’s not likely to take the form of an aggressive, overt military attack. Fears of new wars are far from accurate.

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#### Right-wingers will maintain control.

Walsh 20—(Research Associate at the Institute for Advanced Sustainability Studies in Germany, master’s degree from Fo Guang University, Taiwan). Walsh, Zach. 2020. “Breakdown or Breakthrough? Degrowth and the Great Transition.” openDemocracy. February 16, 2020. https://www.opendemocracy.net/en/transformation/breakdown-or-breakthrough-degrowth-and-great-transition/.

Indigenous people, for example, have already experienced the apocalypse and indigenous knowledge has been warning us about climate change for centuries. As the image below shows – with the causes of eco-injustice in the center and their antidotes around the edge - the roots of today’s global crises are not new. Capitalism, colonialism, patriarchy, white supremacy, state violence, and Enlightenment humanism (and its domination of non-humans) underlie our global crisis and the Great Unraveling of civilization. Today’s troubling rise of eco-fascism, for example, coincides with a global rise in white supremacy, authoritarianism, and right-wing nationalism. “We are seeing the beginnings of the era of climate barbarism,” writes Naomi Klein. A growing number of “preppers” are building bunkers and stockpiling resources. The ultra-rich are buying $3 million apartments in underground missile silos to comfortably survive future catastrophes. Such responses protect the power and privilege of people who benefit from the collapsing system. They offer no breakthrough paths for transitioning society towards greater justice and sustainability. People who accept the Great Unraveling as the only reality tend to embrace rugged individualism, tribalism and protectionism. They see a dying system and respond reactively under stress. On the other hand, people who respond proactively through solidarity, justice and collective action are laying the groundwork for the Great Transition.

#### Litany of empirics prove decoupling—acid rain, water, sulphur, ozone, deforestation, ag, and renewables.

Phillips 19—(environmental journalist, has written for Nature, the Guardian, the Daily Telegraph, the New Statesman, Businessweek and the EUobserver). Phillips, Leigh. 2019. “The Degrowth Delusion.” openDemocracy. August 30, 2019. <https://www.opendemocracy.net/en/oureconomy/degrowth-delusion/>.

And because degrowth rejects the notion of socialist economic growth, it commits three grave errors. First, degrowth lets off the hook the real source of the problem, thus condemning civilisation to dangerous climate change and parallel ecological threats. Second, degrowth unwittingly endorses what would be an imposition of austerity on the Western working class far beyond anything a Thatcher, Cameron or May could imagine, this time in the name of the planet. And, worst of all, degrowth would bring an end to progress itself—the steady expansion of freedom for all humanity. 1. The Curious Case of the On-the-Mend Ozone Layer We can see the first major error of the degrowth concept if we turn our attention to past environmental challenges that we have actually overcome. The evidence is clear that it is planning—typically regulation, but also via public-sector infrastructure spending and industrial policy—not reduction in economic growth, that was responsible for these victories. It is worth remembering that we have solved a fair few ecological problems, from acid rain over the Great Lakes to air and water quality in many Western nations. Until the 1980s, sulphur dioxide pollution was tied tightly to economic growth in the OECD club of wealthier nations, but it is no longer. Not enough ecological problems have been solved to be sure, but we need to investigate where there has been success—largely thanks to the struggles of trade unions, impacted communities, and environmental groups—in order to learn the lessons of what works. Where there has been subsequent deterioration after achieving such successes—such as the scandalously still-unresolved lead contamination of water in Flint, Michigan—this has been the result of neoliberal retreat from non-market intervention: privatisation, deregulation, regulatory capture, and underfunding or outsourcing of inspection. In the case of Flint, we can add to this list the neoliberal era's neglect of water infrastructure, particularly with respect to that servicing less-profitable minority and poor communities. Likewise, neoliberal racism that resulted in infrastructural breakdown and underconsumption of water resources by poor and racialised neighbourhoods was responsible for the water crisis in Cape Town, not overconsumption. But perhaps the greatest environmental victory yet has been the healing of the ozone layer. In the 1980s, depletion of atmospheric ozone, particularly around the poles, was that era's version of existential ecological crisis. It was also no less threatening to humanity over the near term than climate change via an increase in skin cancer and immune deficiency disorders as well as negative impacts on terrestrial and near-surface aquatic food webs and biochemical cycles, and reduction in agricultural yields. And the cause was also anthropgenic emissions: this time primarily chlorofluorocarbons (CFCs) that were popularly understood, roughly correctly, as being used in refrigerators and aerosol sprays. Since the 1987 Montreal Protocol ban on ozone-depleting substances, including CFCs, such emissions have declined by 98 percent (there has however been an uptick in unreported emissions since early this decade from east Asia, suggesting someone in the region is cheating). Ozone depletion reversed by the 2000s and full recovery is expected by 2075. Having grown up in the 80s, I remember at the time bugging my mum to stop buying cans of hair spray. She did not follow my advice. Thankfully my advice was not taken by policymakers either. Instead, the Montreal Protocol regulatorily intervened in the market against and over the wails and lobbying efforts of the industries affected. Had we embraced degrowth with respect to ozone depletion by attempting to arrest growth in, say, the number of fridges in the world—or even reduce the total number—instead of regulation to enforce technology-switching, disaster would have befallen us. Saying "this many fridges and no more" would only have arrested the growth in emissions, not emissions tout court. (For the same reason today, it is not enough to keep greenhouse gas emissions steady, but eliminate them) It simply would not have worked in any case, as by what right can developed nations tell the global south that they cannot keep their food fresh while they continue to do so? (Indeed, one might say that the socialist argument is instead: There still are not enough fridges in the world.) Today there are more cans of hair spray and more fridges than ever before. The latter not least in the developing world, where refrigeration enhances quality of life through expansion of the range of food available, reducing food contamination, and improving nutrition. It also reduces food waste and therefore greenhouse gas emissions. There has been an absolute decoupling of growth in the technologies that historically used ozone-depleting substances from growth in ozone depletion. The degrowth position maintains that absolute decoupling of growth from negative environmental impact is impossible, and that only relative decoupling—or reduced resource use per unit of production but increased production overall—is possible, but the story of ozone depletion shows this belief to be false. Economic growth has been absolutely, not relatively, decoupled from ozone depletion. There are many, many other examples. Europe’s forests have grown by a third over the last century. Timber was used in almost every economic sector around 1900—for fuel, for furniture, house construction, even metal production—meaning that there was little forested areas left on the continent. But technological innovation in agriculture such as motorization, better drainage and irrigation reduced cropland as less area was needed to produce the same volume of food. In addition, there was a mass migration away from rural areas to the cities and, crucially, states after World War Two invested heavily in reforestation. Indeed, once a nation reaches a certain per capital income threshold, net deforestation ceases. Globally, tree cover has increased over the last 35 years. Across the Atlantic, there were more dairy cows in the United States in 1870 than today, when the country has roughly ten times the population, according to the US Department of Agriculture. US crop production has increased even as agricultural inputs such as fertilizer, water and crop acreage have declined or plateaued, with the decline in fertilizer use being particularly sharp. Corn acreage has been absolutely decoupled from corn production. American potato yields continue to increase but the potato market is saturated, so potato production has plateaued, meaning that land is removed from production. Across the agricultural sector, this has meant an area of farmland the size of Washington State has been returned to nature, according to a forthcoming analysis by MIT business scholar Andrew McAfee. McAfee also notes how US consumption of metals marched in lock-step with GDP until about the 1980s. Since then, consumption of important metals such as aluminium, nickel, copper, steel and gold have plateaued or declined. This takes into account imports and exports, so globalization is not the reason for this. One important paper from degrowth advocates argues that this is simply because traded goods have a greater material impact than merely what is incorporated into them (think of the difference between an ingot of steel versus raw iron ore). Once this is taken into account, suggests another paper by a leading degrowth advocate, OECD absolute decoupling reveals itself to be a mirage, and globally economic growth remains as coupled to use of materials as ever—although, interestingly, that same paper notes this is primarily a result of offshoring of just construction materials. But this is a global consideration of material inputs, so a range of sectoral absolute decouplings goes unnoticed, and global ones that are immaterial are likewise ignored. CFC absolute decoupling is global but unrecognized because measurement of material inputs doesn’t capture this. The sharp reduction in emissions of carbon monoxide, sulphur dioxide, nitrogen oxides, lead and particulate in Europe and America has come from regulation; they have not shifted overseas. US agricultural absolute decoupling has likewise not been a product of offshoring, as inputs here are primarily domestically sourced. A global decoupling of greenhouse gas emissions from growth (in principle feasible, but very far from being implemented) likewise would be missed by such an analysis. And even more importantly, the very fact that there has already been a great many demonstrable examples of regional and global absolute decoupling in different sectors disproves the claim of the impossibility of absolute decoupling. The only question that remains is whether absolute decoupling can be extended across all sectors, or sufficient sectors as to eliminate undermining of ecosystem services. Where free-market champions of absolute decoupling like McAfee are wrong however is their explanation for why it happens. McAfee believes it is vicious capitalist competition that drives technological innovation to reduce the costs of inputs. He concedes that some regulation is necessary, but fundamentally it’s market pressures that produce this of their own accord. It is of course great when there is a happy coincidence of profitability and reduction of ecological harm, but if ever there is a conflict between these two, it’s profitability that wins out. And the reality is that America’s Clean Air Act, Clean Water Act and similar regulations across industry—in the face of furious opposition from private companies—have been responsible for most of the major environmental advances in the US. And the story is similar elsewhere. Since 2005, emissions had absolutely decoupled from global beef production, primarily as a result of the Brazilian Workers’ Party’s crackdown on the razing of forest for agricultural production—a magnificent success story currently being disastrously undone by that country’s hard-right government of Jair Bolsonaro. Denmark, a world leader in nitrogen pollution management, has achieved a reduction in fertilizer use even as agricultural output has increased through a muscular state-led nitrogen strategy across the agricultural sector that involves stringent regulation, RD&D funding and infrastructural build-out. One might also respond that technology-switching away from fossil fuels is a much more difficult task than switching away from CFCs or nitrogen recycling. And the response must be that this is certainly true, as this shift affects almost every sector of the economy. But difficult is not the same thing as impossible. Eight major economies—France, Norway, Sweden, Switzerland, Ontario, Quebec, British Columbia and Paraguay—have already either largely or all-but completely decarbonized their electricity grids even as they enjoy economic growth (all by depending primarily on nuclear and/or hydroelectricity). These are models for the world. Cleaning up transport, industry and the built environment will likewise need a muscular public-sector interventionist approach.

## DA

#### Large data pools k2 AI innovation – DA breaks up databases

Fatima, 20

(Samar, School of Management, QUT Business School, Queensland University of Technology, Kevin C. Desouza, Professor of Business, Technology and Strategy, School of Management, QUT Business School, Queensland University of Technology, Centre for Future Enterprise, Queensland University of Technology, and Gregory S. Dawson, Clinical Professor, School of Accountancy, W.P. Carey School of Business, Arizona State University, “National strategic artificial intelligence plans: A multi-dimensional analysis”, Economic Analysis and Policy 67 (2020) 178-194, <https://doi.org/10.1016/j.eap.2020.07.008)\\JM>

5.3. Data The critical ingredient for AI systems is data. The data helps inform the development of algorithms and the output of AI systems. AI systems thrive on having access to large datasets that come in various forms (images, videos, text, etc.) and from multiple sources (e.g., social media platforms, corporate information systems, IoT sensors, etc.). National-level interest in the economics of building and managing large-scale data repositories has increased in recent times (Desouza and Jacob, 2017). The performance of AI systems is often a function of the data used to train the algorithms. In recent times, we have seen cases where AI systems have caused grave harm, e.g., incorrectly sentencing people to jail (Hao, 2019) due to a lack of care in data management when training the algorithms (Bozdag, 2013; Danks and London, 2017). Clearly, as countries contemplate the role that AI will play in society, it will be important to give due consideration to the data.

#### Breaking up big tech destroys Pentagon AI innovation – less R&D and smaller datasets prove

Foster, 20

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Fourth, we assume national security-relevant AI technologies will result, to some extent, from breakthroughs in general, commercially oriented AI innovation. Most private AI research is not defense-oriented, given the Pentagon’s relatively minor role as a customer.34 Nonetheless, many private sector AI advances are or will be convertible to military ends.35 Some of this innovation will be transferred directly from the commercial or lab setting to defense applications by the original innovators—that is, commercially oriented tech companies. One recent example is Project Maven. In other cases, defense-focused intermediaries will convert other companies’ AI advances into military applications.36 We assume future AI breakthroughs, whether originating in the private sector or at universities, could be converted into defense applications. Innovate: Would smaller AI companies be less innovative? In this section, we evaluate the relationship between scale and innovation. Given a greater number of smaller companies in the AI market, would they and the overall market be more or less innovative? We consider the relationship between firm size and access to data, a critical input for AI innovation. We also examine the relationships between company scale, R&D expenditures, and innovation. If innovation tracks R&D spending, a post-breakup AI sector could be less innovative. Anti-competitive tactics are another concern. Finally, we consider other inputs and factors affecting AI innovation, including business strategy, human capital, and access to computing power. We estimate that antitrust action will likely reduce the net amount and diversity of data held by firms that are broken up and could also reduce firms’ R&D budgets. However, the effect these losses will have on innovation remains unclear. Similarly, we expect firms’ computing resources to diminish with yet undetermined consequences; shared compute resources could perhaps more than compensate for any loss. Data Quantity Data is a core ingredient in AI development, especially for AI algorithms using machine learning approaches (such as neural networks). Currently, in order to build machine learning models that successfully identify patterns, AI researchers need large volumes of data.37 Models trained on larger datasets are more accurate,38 advantaging big firms with more data and users.39 Breaking up these companies would diffuse large datasets, potentially slowing or preventing AI advances that could benefit the Pentagon. Even though datasets amassed by commercial companies may not always have immediate use for the Defense Department, we expect that most of Big Tech’s data can directly or indirectly support innovation relevant to the Pentagon.40 However, policy mechanisms, such as a federal data pool or mandated datasharing, could increase smaller firms’ access to data and mitigate this concern. Similarly, firms could contract with one another to increase data access. Such actions could equalize the data playing field or even give small firms an advantage. In addition, standardized data pools might be better for building or training models than the current system of disorganized or siloed data at large firms. At the same time, these mitigating mechanisms could discourage investments to secure additional data, reducing overall data quantities.41 For example, a company might rely on a publicly supported database instead of building an innovative application to collect data by other means. 1. How much data do firms really need to innovate? All else being equal, smaller AI firms have less data. While the relationship between the quantity of data inputs and the quality of algorithmic outcomes is not linear, a correlation is usually evident. For example, recent experiments by researchers at Google found a logarithmic relationship between the amount of data fed into an image recognition model and the model’s performance.42 If more data means more innovation, a post-breakup AI sector could be less innovative overall. Antitrust action would likely reduce the amount of data held by large companies. This might hurt innovation, especially in application areas requiring exceptionally high amounts of data for acceptable performance.43 In short, the impact of antitrust action on data-driven innovation may hinge on the size of broken-up companies and their data holdings. Google Search or Amazon Web Services, for example, would be large corporations in their own right.44 AWS, one of Amazon’s larger divisions, achieved revenues similar to Raytheon’s company-wide revenues in 2018,45 demonstrating the possible size of spin-offs.46 Although data currently plays a central role in machine learning approaches to AI, some question its future significance in innovation.47 Less data-intensive machine learning approaches, such as few-shot learning and training on synthetic data, raise questions about the long-term relevance of data to AI.48 In the longer term, data may be less important to innovation than presently thought, in which case a lower threshold (smaller quantities of data) might not significantly undermine innovation. Similarly, reduced access to traditional data inputs may incentivize companies to invest in alternative data collection and training approaches, which could spur new innovation. 2. How well are larger firms able to use the large quantities of data they have? Data only matters for innovation insofar as it can be accessed and used. Large companies may struggle to fully utilize their large data holdings, potentially limiting harm to innovation in the case of antitrust enforcement. Larger companies can’t necessarily consolidate and access all of their data. Siloing and scattering occur when data is isolated within certain departments, inhibiting broader collaboration or cross-company use. Data curation—the management and integration of data—also affects its functionality. AI models are only as strong as their training data, and without adequate curation, training data usability diminishes.49 Training AI models also requires flexible data easily adjusted or re-configured to fit various training approaches. 90 percent of manufacturing lacks this flexible format.50 Siloing and scattering disproportionately affect larger companies.51 At Chinese AI giant Tencent, for example, executives report that siloed data prevents the company from using its WeChat app data to improve other products.52 A third of executives at large U.S. companies53 report that data siloing impedes data utilization efforts.54 While antitrust action would likely limit the quantity of data within companies, it might not limit the amount of accessible, useful data as sharply if much of that data was inaccessible to begin with. On the other hand, if large companies currently leverage their diverse data well, collaboration between companies or between government and industry could mitigate the winnowing effect of antitrust enforcement. In 1987, DARPA funded SEMATECH, a consortium bringing together leading U.S. semiconductor companies, in an attempt to improve domestic semiconductor competitiveness.55 SEMATECH significantly reduced the amount of R&D funding needed to produce “each new generation of chip miniaturization” and lowered miniaturization cycles from three years to two.56 Today, other consortiums like the National Alliance for Advanced Transportation Battery Cell Manufacture and the Department of Energy’s solar initiative, SunShot, are modeled on SEMATECH.57 AI may call for a similar approach; short of breaking up leading tech companies, antitrust policymakers may even consider mandated data sharing (whether through consortia or other means) as an effective antitrust remedy. Data Diversity Diverse data can also enhance innovation. Given the option, Fortune 1000 companies are more likely to diversify data sources than expand the quantity of data from existing sources.58 Of Fortune 1000 executives, 69 percent reported that data variety was the most important factor in their data success.59 Companies with more diverse data receive “faster intelligence” about products and market trends, which may enable them to better anticipate next-generation technologies.60 Consistent with this broader dynamic, we assume companies with greater data variety would be better positioned to build new technologies for the Pentagon and other government customers. However, not all corporate data will be a relevant input for Pentagon applications. Mission-specific applications, in particular, will likely rely to some degree on classified or otherwise unique data already held by the DOD. 1. Do larger firms have more diverse data? The sheer scale of large tech companies makes their data quite diverse; all else equal, smaller AI firms have less diverse data. Alphabet, for example, collects data from Google Search, Maps, YouTube, and Gmail. Antitrust action could reduce the diversity of data held by large tech companies as they fracture and focus on narrower markets. Even if the broken-up companies and their data stores remained large, this data would lose appreciable diversity. If more diverse data means more innovation, a postbreakup AI sector could be less innovative overall. However, if companies’ data did become more homogenous, adverse effects could be mitigated. Companies created in the wake of antitrust enforcement would collectively hold diverse data. Creating a centralized data pool might yield an even more diverse stockpile of data than what’s currently held by the likes of Google or Amazon. The NIH’s Data Commons offers one such example, with proposals circulating to create a similar global data commons for AI.61 Data sharing through contracts or centralized pools would, however, present an additional set of challenges, including privacy concerns and data security. 2. How well do larger firms leverage their diverse datasets? Large companies may struggle to fully utilize their diverse datasets, limiting both the innovation upside of diverse data and the innovation downside should antitrust enforcement result in more homogenous datasets. Siloing concerns apply equally to diverse datasets. Antitrust enforcement becomes far less of a threat to innovation if companies cannot currently leverage their diverse data. R&D Spending 1. What is the relationship between scale and R&D expenditure? If R&D spending drives innovation, firms that can spend more on R&D— presumably large ones—will generally hold an edge in innovation. A postbreakup AI sector could be less innovative as a result. Large tech companies do in fact spend more on R&D both in absolute and relative terms. According to PricewaterhouseCoopers, in absolute terms, Amazon and Alphabet were the world’s top two corporate R&D spenders in 2018, with Samsung, Intel, Microsoft and Apple in the top ten.62 In terms of relative R&D spending—the percentage of total firm expenses spent on R&D—large tech companies remained among the highest spenders, led by Facebook (33 percent) in fifth place globally.63 Alphabet and Microsoft, which each spent 20 percent, and Amazon (13 percent) ranked among the top thirty. The smallest firm (based on total operating expenses) of the top 100 global relative R&D spenders was NXP Semiconductors, a Dutch firm with $6.8 billion in operating expenses.64 Because larger firms tend to spend more on R&D, breaking them up would likely reduce their R&D spending. Increases in spending at smaller firms could counter this decline, but the amount and efficacy of that spending are uncertain—both at the individual firm level and in the aggregate across the post-breakup AI ecosystem.65 That said, broken-up firms would remain very large, with sizable R&D budgets to match. Imagine a break-up of Alphabet, whose operating expenses amounted to $110 billion last year; a spin-off company with one-fourth of Alphabet’s current R&D budget would still be larger than 77 of the 100 leading global relative R&D spenders. 2. What is the relationship between R&D expenditure and innovation? AI innovation is expensive.66 If R&D spending fuels innovation, larger, wealthier companies with more to spend on R&D will likely lead. However, the research is contradictory: some studies indicate larger R&D expenditures yield greater innovation, while others find the opposite. Existing research on R&D may not translate neatly to AI innovation; for example, little research considers differences between massive companies like today’s tech giants and very large corporations. Analysis of “small” firms’ R&D patterns may not apply to potential post-breakup tech companies, which would probably remain quite large. In addition, much of the existing literature is years or decades old, and may not pertain to the fast-evolving AI economy. Nevertheless, existing research can at least guide further work, consistent with the questions and research priorities we frame in this paper. Since the writings of economist Joseph Schumpeter in the mid-20th century, researchers have debated the relationship between innovation and R&D resources. Schumpeter argued that a strong correlation exists, noting that large firms have the resources to support risk-taking, more experienced and specialized staff, and cheaper access to capital.67 He believed these characteristics made larger firms optimal for economic growth and innovation.68 Significant research now contradicts Schumpeter’s work. Some studies show R&D productivity decreases with firm size,69 and smaller firms are “more profit/cost efficient in innovation,”70 generating more patents and more citations per dollar spent on R&D.71 Smaller firms are also “disproportionately responsible for significant innovations,”72 compared to larger firms that produce fewer innovations per dollar spent.73 Even among larger firms, innovation doesn’t neatly track with R&D budgets. For example, Apple ranked as the 2018 Global Innovation 1000 Study’s most innovative company, but spent a relatively modest 5.1 percent of overall sales on R&D— far from the highest percentage among companies in the index.74 However, other researchers back Schumpeter. Their work finds large firms are more R&D “intensive”75 and responsible for “higher quality” innovations.76 Some posit that “R&D spending and R&D productivity increase with scale,” as does “basic research, process innovation, and incremental innovation.”77 Large firms conduct almost six times more R&D, in aggregate, than small firms, and do so more productively.78 Collectively, large firms make up 87 percent of the “economic contribution of industrial R&D,” making them the disproportionate engines of innovation.79 Clearly, no consensus exists around how R&D spending influences innovation. Predicting how antitrust action on R&D resources might affect AI company innovation is therefore difficult. However, some researchers argue more specifically that large firms are more ideally suited for research that utilizes “economies of scale and scope, or requires large teams of specialists such as fundamental, science-based innovations and large-scale applications.”80 AI research, with its high degree of specialization, may fall into this category.81 If so, scale-reducing antitrust actions could prove damaging.