# Opensource---Round 2---NU

# 1AC

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### Plan---1AC

#### Plan: The United States federal government should prohibit private sector business practices that violate an effective competition antitrust standard.

### Adv---1AC

#### The advantage is the economy:

#### Antitrust law is failing now---current market consolidation undermines innovation, slows growth, and suppresses productivity. Promoting competition solves.

Fiona M. Scott Morton 20. Theodore Nierenberg Professor of Economics at the Yale University School of Management. “Reforming U.S. antitrust enforcement and competition policy,” https://equitablegrowth.org/reforming-u-s-antitrust-enforcement-and-competition-policy/.

Evidence that antitrust laws are falling short is plentiful. Many cartels go undiscovered, and tacit collusion is probably even more prevalent because it is harder for antitrust enforcers to prosecute and deter.9 Anticompetitive horizontal mergers (between rivals) appear to be underdeterred.10 A variety of clever strategies used by incumbents to exclude entrants, either by purchasing them when they are nascent or using tactics to confine them to a less threatening niche or forcing them to exit have been successfully deployed in recent years, often when antitrust enforcement is late or absent.11

Each of these sources of concern can be critiqued, but together they make a compelling case. Some of the evidence may have benign explanations in part, such as the growing importance of fixed costs, for example, when creating software or pharmaceuticals that leads naturally to higher markups, or the increasing benefit of being on the same platform with other users (known as “network effects” in the case of a social media site). Firms in industries with high fixed costs or large network externalities may exhibit high profits and productivity and low labor shares, and may earn high profits because they had a good idea early and executed well, thereby getting adoption from many consumers.12 Nonetheless, the overall picture is clear that market power has been growing in the United States for decades. Moreover, even where the explanation for growing market power is benign, we must ensure that companies do not use anticompetitive tactics to protect their position.

Firms with market power need not compete aggressively to sell their products, so they tend to raise prices, reduce quality, and/or innovate less. Market power can also contribute to slowed economic growth by, for example, suppressing productivity increases.13 Theoretical and empirical economic studies convincingly show that innovation is harmed by anticompetitive conduct.14

This is why antitrust enforcement is such a terrific policy tool to strengthen competition—it does not come with an efficiency downside, as do most policies that redistribute income. Policies that enhance competition are unambiguously beneficial for efficiency, as well as inclusive prosperity, with minor qualifications.15 Other policies for addressing inequality, in particular, such as labor market and tax policies, may create disincentives or allocative efficiency losses that must be weighed against their distributional benefits. Policies to enhance competition, by contrast, offer what is close to a free lunch.16

#### The plan solves---and effective competition standard reinvigorates antitrust.

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America, as legal and economic scholars are increasingly noting, has a market power problem. The emerging evidence points to less competition, higher markups, greater concentration, and widening wealth and income inequality. The current state of competition law benefits the select few—at the expense of nearly everyone else.

Our antitrust laws are supposed to deal with concentrated economic power. The problem is that the laws have been hijacked in two ways. First, ideologues narrowed the substance of antitrust from addressing a variety of goals to focusing solely on the concept of consumer welfare—namely, that harm to competition within the legal meaning of the antitrust laws consists solely of harm to consumers and their welfare, as measured almost exclusively by price and quantity effects in output markets. Second, some courts and enforcers went even further, declining to find antitrust liability in conduct that harms consumers on the theory that it carries other benefits, like long-run economic growth. Recent US Supreme Court decisions, including Ohio v American Express Co, and the US District Court’s decision to allow the AT&T/Time Warner merger illustrate how antitrust, under the prevailing consumer welfare standard, has been weakened and distorted beyond all recognition. Courts have elevated the burden of proof on the government and other antitrust plaintiffs to such an extent that the Sherman and Clayton Antitrust Acts have become unenforceable for many anticompetitive practices, other than cartels.

If the United States continues with a light-if-any-touch antitrust review of mergers and turns a blind eye to abuses by dominant firms, concentration and crony capitalism will likely increase, competition and our well-being will decrease further, and power and profits will continue to fall into fewer hands. Startups, small and midsize firms, and Americans more broadly—as workers, consumers, and democratic citizens—will be left to the beneficence or spite of a few powerful, but arbitrary, corporations.

This trend is reversible if we restore antitrust as a guarantor of effective competition. To tackle today’s market power problem, we offer an effective competition antitrust standard to replace the prevailing consumer welfare standard, which courts and scholars have interpreted differently (and at times inconsistently). The effective competition standard restores the primary aim of the antitrust laws—namely, the dispersion and deconcentration of significant private power wherever in the economy it is to be found, including throughout supply chains and in the labor market.

#### It's enforceable and sufficient.

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The effective competition standard differs from both the consumer welfare standard and the total welfare standard in that it expressly departs from the partial-equilibrium analysis of a single market as the basis for antitrust analysis. The effective competition standard further differs from the consumer welfare standard in four important ways:

• First, a substantial lessening of competition suffices for liability. Enforcers and courts need not demonstrate how the lessening of competition harms consumers, nor balance the harms to one set of stakeholders against the supposed benefits for another. In this respect, the effective competition standard makes antitrust more enforceable.

• Second, it recognizes that competition needs competitors. Thus, it takes a tougher stance on monopolistic, predatory, and exclusionary practices, which often reduce the competitive opportunities for entrants and rivals.

• Third, unlike the consumer welfare standard, which considers the impact only on consumers, the effective competition standard protects market participants throughout the supply chain, including workers and sellers.

• Finally, by eliminating the precarious step of how the lessening of competition will harm consumers’ welfare, the effective competition standard restores the purpose of the Clayton Act to “arrest restraints of trade in their incipiency and before they develop into full-fledged restraints violative of the Sherman Act.” As Congress noted, “A requirement of certainty and actuality of injury to competition is incompatible with any effort to supplement the Sherman Act by reaching incipient restraints.”

To promote competition and innovation in our heavily concentrated markets, the effective competition standard would depart from today’s light-touch antitrust policies in the following areas.

#### Scenario 1 is Growth:

#### Sustained anti-competitive behavior is regressive and makes economic collapse inevitable.

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The direct cost of anti-competitive behavior is high. Many studies estimate this cost by implied price overcharge, typically stemming from identified cartels. A common approach to estimating the price overcharge consists in applying a difference-in-difference technique, that is, by comparing prices in a market before and after an infringement was identified (e.g., a cartel) to a “counterfactual” market in a different location or product market where no infringement was identified.3 The estimated price overcharges in advanced economies are found to be large on average, ranging from 15 to about 50 percent. Ivaldi et al. (2017) extends these estimationsto 20 developing economies, using a database of over 200 major cartel episodes over 1995–2013. They estimate that the harm to the economy in terms of excess profits resulting from price overcharges could reach about 4 percent of GDP, accounting for the probability of undetected cartels. The cost of cartels could extend to overcharges in intermediate goods, ultimately affecting finished products, as well as procurement of public goods, or it could also affect the economy through a reduction in output (World Bank-OECD 2017). Even without cartels, anti-competitive behavior would result in higher prices and lower production.

There is also growing evidence that the lack of competition not only affects more strongly the poorest countries but also hurts the poor more in each country. Higher market power in food, beverages and medicines was shown to be regressive, that is, they hurt more the poorest, as shown using Mexican data (Urzua 2013). Similar results exist in the context of advanced countries (e.g., Creedy and Dixon 1998 and 2000). There is also evidence that prices in sub-Saharan Africa are higher than in other developing regions, controlling for income and other factors. The extra cost of living in this region is negatively correlated with aggregate measures of competition (IMF 2019a). OECD (2017), using a calibrated model on a selected group of advanced countries, finds that market power could be responsible for a sizable increase in the wealth of the richest 10 percent and a large reduction in the income of the poorest 20 percent.

The decline in the labor share has also been interpreted as a sign of rising market power. Labor share has been decreasing in the U.S. and other advanced economies (IMF 2019b). This decline in labor share could be explained to a large extent as a result of the Information Technology (IT) revolution as argued by Aghion and others (2019). This revolution allowed superstar firms to expand into many sectors of the economy. As these firms have higher markups and lower labor shares than non-superstar firms, the decline in aggregate labor share and corresponding increase in aggregate markups reflect a “composition effect”. In other words, it is not the result of a within-firm increase in markup or a decline in labor share. Evidence of the predominance of a “between-firm” (or “composition”) effect over a “within-firm” effect is provided by De Locker and Eeckout (2019) and Baqaae and Farhi (2019). IMF (2019b) shows that the “reallocation” effect is pronounced in the U.S. but less so in other advanced countries. The long-term effect of this increasing hegemony of superstar firms has been to discourage innovation and entry by non-superstar firms, thereby leading to a decrease in aggregate productivity growth, broad-based growth, and business dynamism. This increasing hegemony, in turn, has been facilitated by an insufficient regulation of mergers and acquisitions, in other words by a competition policy, which has not adapted to the digital economy.

#### State-based market interventions are key to sustainable growth. The alternative to well-measured corrections is an unfettered and regressive free market.

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There is a positive correlation between long-term growth and poverty alleviation. More specifically, Lant Pritchett argues, based on cross-country patterns, that “broad-based growth, defined as the process that raises median income, is far and away the most important source of poverty reduction.”9 The sharp decline in poverty rates in China (about 800 million people escaped poverty) amid the two decades of break-neck growth is the starkest illustration. As discussed, innovation-based growth based on Schumpeterian creative destruction is key to productivity gains and sustained growth. The question is how to achieve broad-based, high and sustained growth which means to spur the emergence of good paying jobs. This is perhaps one of the most difficult and debated questions in economics.

The standard view shared by most economists over the last few decades is that “horizontal policies”, that is improvements in education, the quality of institutions, infrastructure, business environment, and regulations are key. Many of these policies tackle what is known as “government failures” as described in Rodrik (2005). In other words, state intervention should limit itself to providing public goods and the provision of a good environment while crucially ensuring an adequate level of competition. In this context, firms would have the incentive to invest and deploy efforts to be competitive through improvements in productivity and innovation to offer new and better-quality goods among others.

However, growth can be harmed by anti-competitive behaviors or distortive policies which can take different and subtle forms and are not always easy to gauge. Among these, imposing barriers to entry or helping non-performing firms remain in business, could have a substantial negative effect. Hsieh and Klenow (2009) emphasize the importance of input reallocation effects. They show that aggregate productivity differentials can be explained by differences in terms of the distribution of firms’ productivity. This means that relatively less productive firms have access to a considerable share of the resources. They argue that it is harder for a more productive firm to grow but also easier for a less productive firm to survive in India than in the U.S. for example. In the same vein, Aghion (2016) suggests that that there is more business dynamism in the U.S. than India, that is more firms enter and exit, which would explain input misallocation and differences in income per capita.

Compared to the U.S., potential constraints in developing economies such as India include more rigid capital markets and labor/product markets, the lower supply of skills, the poorer quality of infrastructure, and the lower quality of institutions to protect property rights and to enforce contracts. However, even if markets are perfectly competitive and an adequate environment is ensured, the economy may still not reach its full potential. This is because of “market failures,” which typically happen in the presence of externalities. They are at play when firms and workers do not fully internalize the effects of their decisions on the broader economy and their dynamic implications. Typically, they are learning externalities, coordination failures, or information asymmetries (Rodrik 2005).

As argued by many, (e.g., Arrow 1962) and Matsuyama 1992) some activities entail higher productivity gains, or more learning potential, for an economy compared to other traditional activities such as non-tradable services or agriculture. Firms may not be fully aware of these productivity gains, leading to lower output in high-productivity sectors and lower relative incomes over time. The coordination failure is based on the idea that a critical size of the modern sector is needed for a firm to enter it. It would be profitable for a firm to invest in a modern sector only if there are enough firms investing simultaneously in other modern sectors. If many firms invest together in modern sectors, described as the “big push,” economy reaches a higher level of productivity and development (Rosenstein-Rodan 1943, Murphy et al. 1989). Lastly, information asymmetries exist if there is imperfect information about new markets and products, and firms underinvest as a result (Hausman and Rodrik 2003). This is clearly seen in firms trying to export and penetrate new geographical markets with their products.

In theory, tackling these externalities would necessitate a state intervention, broadly defined as industrial policy. However, the scope, the tools and whether it could in practice be superior to a more “laissez-faire” approach, leaving the outcome to unfettered competition, is the object of an ongoing debate. At the heart of the debate lies the definition of what constitutes a “modern” sector, which is conducive to productivity gains and spillovers to the rest of the economy. While it is typically associated with manufacturing (Matsuyama 1992 and Krugman 1987) or related to the concept of sophistication (Hausman, Hwang and Rodrik 2007 and Cherif and Hasanov 2019), others argue that service sectors could also play a role (IMF 2018). More important for inclusive growth, if a sector is to be targeted, it should help achieve broad-based growth to contribute to poverty alleviation. In practice it means that it should also generate (directly or indirectly) enough employment, and the level of skills to fill those jobs should be realistically met over the medium term.

The other key question relates to how state intervention to tackle externalities could curtail or distort competition. Indeed, state interventions of the past typically followed the model of import-substitution policies. The main idea was to protect domestic producers from international competition by imposing barriers to trade, such as high tariffs. In many cases, the curtailment of competition went further and encompassed the domestic market as countries relied on one or very few “champions” to achieve import-substitution goals. The many past failed cases in Latin America and the Middle East imply that such policies may be counterproductive in general (Cherif and Hasanov 2019). The comparison of Malaysia’s foray into automotive industry in the 1970s with its champion Proton to the success of Korea’s Hyundai is a case in point (Cherif and Hasanov 2019b). After decades of support and protection from domestic and international competition, Proton depended on imports of critical inputs, including the engine. The high tariffs to protect it also meant that consumers had to pay higher prices for lower quality products. In comparison, although Hyundai benefitted from state support as well, it was also forced early on to compete both on the domestic and international markets. It could be argued that competition provided Hyundai with an incentive to innovate and take advantage of economies of scale.

Moreover, support for firms could be pursued without necessarily implying less competition. Aghion and others (2015) develop a simple model showing that targeted subsidies can be used to induce several firms to operate in the same sector, and that the more competitive the sector is, the more it will induce firms to innovate in order to “escape competition” (Aghion et. al. 2005). Of course, a lot depends upon the design of industrial policy. Such policy should target sectors, not particular firms (Aghion 2016). Using Chinese firm-level panel data, Aghion and others (2015) look at the interaction between state subsidies to a sector and the level of product market competition in that sector. They show that TFP, TFP growth, and product innovation (defined as the ratio between output value generated by new products to total output value) are all positively correlated with the interaction between state aid to the sector and market competition in the sector. In other words, the more competitive the recipient sector is, the more positive the effects of targeted state subsidies to that sector are. Infact, for sectors with low degree of competition the effects are negative, whereas the effects become positive in sectors with sufficiently high degree of competition. Finally, the interaction between state aid and product market competition in the sector is more positive when state aid is less concentrated.

Yet, there are externalities that can be tackled without curtailing competition with the potential to have a sizable contribution to broad-based growth and poverty alleviation. These are typically related to informational asymmetries. Bloom and Van Reenen (2010), f or example, show that interventions to improve management practices in Indian small firms can significantly improve productivity. So did the productivity missions of the Marshall Plan in Europe after the WWII (Giorcelli 2019). In the same vein, Atkin et al. (2017) showed that Egyptian rug producers can be helped to access export markets by tackling informational asymmetries and coordination failures. In other words, they showed that interventions such as export promotion agencies can help SMEs advertise their products in foreign markets and act as a communication channel between them and customers. They also showed that export activities helped small producers improve their quality and value added which confirms the importance of export orientation. This focus on SMEs can help increase productivity and tackle inequality at the same time.

The trade-off between the benefits and costs of state intervention suggests that the way the state intervenes in the economy is crucial. This intervention needs to be cognizant of exacerbating government failures such as rent-seeking and corruption. Moreover, even if these interventions are successful in the sense that they create competitive industries and contribute to growth, they should avoid creating “islands” of relatively advanced sectors. If these sectors are disconnected from the rest of the economy, broad-based growth may not be sustained, and it would exacerbate inequality. For example, thanks to interventions and targeted policies, Costa Rica managed to foster a high-tech sector in electronics and health instruments (Spar 1998). Although it led to higher growth and declining poverty as well as productivity improvements in agricultural sectors, high inequality persisted while growth policies for inclusiveness were missing (Ferreira, Fuentes, and Ferreira 2018).

#### Eroding financial resilience causes war---that overcomes traditional barriers to conflict.

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Economic recovery efforts since the 2008-2009 global financial crisis have mainly depended on unconventional monetary policies. As fears rise of yet another international financial crisis, there are growing concerns about the increased possibility of large-scale military conflict.

More worryingly, in the current political landscape, prolonged economic crisis, combined with rising economic inequality, chauvinistic ethno-populism as well as aggressive jingoist rhetoric, including threats, could easily spin out of control and ‘morph’ into military conflict, and worse, world war.

Crisis responses limited

The 2008-2009 global financial crisis almost ‘bankrupted’ governments and caused systemic collapse. Policymakers managed to pull the world economy from the brink, but soon switched from counter-cyclical fiscal efforts to unconventional monetary measures, primarily ‘quantitative easing’ and very low, if not negative real interest rates.

But while these monetary interventions averted realization of the worst fears at the time by turning the US economy around, they did little to address underlying economic weaknesses, largely due to the ascendance of finance in recent decades at the expense of the real economy. Since then, despite promising to do so, policymakers have not seriously pursued, let alone achieved, such needed reforms.

Instead, ostensible structural reformers have taken advantage of the crisis to pursue largely irrelevant efforts to further ‘casualize’ labour markets. This lack of structural reform has meant that the unprecedented liquidity central banks injected into economies has not been well allocated to stimulate resurgence of the real economy.

From bust to bubble

Instead, easy credit raised asset prices to levels even higher than those prevailing before 2008. US house prices are now 8% more than at the peak of the property bubble in 2006, while its price-to-earnings ratio in late 2018 was even higher than in 2008 and in 1929, when the Wall Street Crash precipitated the Great Depression.

As monetary tightening checks asset price bubbles, another economic crisis — possibly more severe than the last, as the economy has become less responsive to such blunt monetary interventions — is considered likely. A decade of such unconventional monetary policies, with very low interest rates, has greatly depleted their ability to revive the economy.

The implications beyond the economy of such developments and policy responses are already being seen. Prolonged economic distress has worsened public antipathy towards the culturally alien — not only abroad, but also within. Thus, another round of economic stress is deemed likely to foment unrest, conflict, even war as it is blamed on the foreign.

International trade shrank by two-thirds within half a decade after the US passed the Smoot-Hawley Tariff Act in 1930, at the start of the Great Depression, ostensibly to protect American workers and farmers from foreign competition!

Liberalization’s discontents

Rising economic insecurity, inequalities and deprivation are expected to strengthen ethno-populist and jingoistic nationalist sentiments, and increase social tensions and turmoil, especially among the growing precariat and others who feel vulnerable or threatened.

Thus, ethno-populist inspired chauvinistic nationalism may exacerbate tensions, leading to conflicts and tensions among countries, as in the 1930s. Opportunistic leaders have been blaming such misfortunes on outsiders and may seek to reverse policies associated with the perceived causes, such as ‘globalist’ economic liberalization.

Policies which successfully check such problems may reduce social tensions, as well as the likelihood of social turmoil and conflict, including among countries. However, these may also inadvertently exacerbate problems. The recent spread of anti-globalization sentiment appears correlated to slow, if not negative per capita income growth and increased economic inequality.

To be sure, globalization and liberalization are statistically associated with growing economic inequality and rising ethno-populism. Declining real incomes and growing economic insecurity have apparently strengthened ethno-populism and nationalistic chauvinism, threatening economic liberalization itself, both within and among countries.

Insecurity, populism, conflict

Thomas Piketty has argued that a sudden increase in income inequality is often followed by a great crisis. Although causality is difficult to prove, with wealth and income inequality now at historical highs, this should give cause for concern.

Of course, other factors also contribute to or exacerbate civil and international tensions, with some due to policies intended for other purposes. Nevertheless, even if unintended, such developments could inadvertently catalyse future crises and conflicts.

Publics often have good reason to be restless, if not angry, but the emotional appeals of ethno-populism and jingoistic nationalism are leading to chauvinistic policy measures which only make things worse.

At the international level, despite the world’s unprecedented and still growing interconnectedness, multilateralism is increasingly being eschewed as the US increasingly resorts to unilateral, sovereigntist policies without bothering to even build coalitions with its usual allies.

Avoiding Thucydides’ iceberg

Thus, protracted economic distress, economic conflicts or another financial crisis could lead to military confrontation by the protagonists, even if unintended. Less than a decade after the Great Depression started, the Second World War had begun as the Axis powers challenged the earlier entrenched colonial powers.

They patently ignored Thucydides’ warning, in chronicling the Peloponnesian wars over two millennia before, when the rise of Athens threatened the established dominance of Sparta!

Anticipating and addressing such possibilities may well serve to help avoid otherwise imminent disasters by undertaking pre-emptive collective action, as difficult as that may be.

#### Those wars draw-in great powers---that outweighs.

Lawrence H. Summers 17. US Secretary of the Treasury (1999-2001) and Director of the US National Economic Council (2009-2010), former president of Harvard University, where he is currently University Professor. “Will the Center Hold?” <https://www.project-syndicate.org/onpoint/recession-or-financial-crisis-political-fallout-by-lawrence-h--summers-2017-12?a_la=english&a_d=5a37edac78b6c709b8d260dd&a_m=&a_a=click&a_s=&a_p=%2Fsection%2Feconomics&a_li=recession-or-financial-crisis-political-fallout-by-lawrence-h--summers-2017-12&a_pa=section-commentaries&a_ps>=.

The risk from a purely economic point of view is that the traditional strategy for battling recession – a reduction of 500 basis points in the federal funds rate – will be unavailable this year, given the zero lower bound on interest rates. Nor is it clear that the will or the room for fiscal expansion will exist.

This means that the next recession, like the last, may well be protracted and deep, with severe global consequences. And the political capacity for a global response, like that on display at the London G-20 Summit in 2009, appears to be absent as well. Just compare the global visions of US President Barack Obama and UK Prime Minister Gordon Brown back then with those of Trump and Prime Minister Theresa May today.

I shudder to think what a serious recession will mean for politics and policy. It is hard to imagine avoiding a resurgence of protectionism, populism, and scapegoating. In such a scenario, as with another financial crisis, the center will not hold.

But the greatest risk in the next few years, I believe, is neither a market meltdown nor a recession. It is instead a political doom loop in which voters’ conclusion that government does not work effectively for them becomes a self-fulfilling prophecy. Candidates elected on platforms of resentment delegitimize the governments they lead, fueling further resentment and even more problematic new leaders. Cynicism pervades.

How else can one explain how the candidacy of Roy Moore for a US Senate seat? Moore, who was twice dismissed for cause from his post on the Alabama Supreme Court, and who is credibly charged with sexually assaulting teenage girls when he was in his 30s, could enter the US Senate as many of his colleagues look the other way.

If a country’s citizens lose confidence in their government’s ability to improve their lives, the government has an incentive to rally popular support by focusing attention on threats that only it can address. That is why in societies pervaded by anger and uncertainty about the future, the temptation to stigmatize minority groups increases. And it is why there is a tendency for officials to magnify foreign threats.

We are seeing this phenomenon all over the world. Russian President Vladimir Putin, Turkish President Recep Tayyip Erdoğan, and Chinese President Xi Jinping have all made nationalism a central part of their governing strategy. So, too, has Trump, who has explicitly rejected the international community in favor of the idea that there is only a ceaseless struggle among nation-states for competitive advantage.

When the world’s preeminent power, having upheld the idea of international community for nearly 75 years, rejects it in favor of ad hoc deal making, others have no choice but to follow suit. Countries that can no longer rely on the US feel pressure to provide for their own security. America’s adversaries inevitably will seek to fill the voids left behind as the US retrenches.

#### Nuclear war outweighs---AND analyzing scenarios for use overcomes apathy.

Andrew Futter et al. 20, Professor of International Politics at the University of Leicester; Samuel I. Watson, Associate Professor at the University of Warwick; Peter J. Chilton, Research Fellow at the University of Birmingham; Richard J. Lilford, Professor of Public Health at the University of Birmingham, “Nuclear war, public health, the COVID-19 epidemic: Lessons for prevention, preparation, mitigation, and education,” Bulletin of the Atomic Scientists, Vol. 76, No. 5, pg. 271-276, 2020, T&F.

It may seem tactless, even perverse, to write about other sorts of disasters that might befall our planet in the middle of a pandemic. But write we must. For the current crisis is a harbinger of crises to come, whether humanmade or natural. While many of the lessons to be learned from the COVID-19 outbreak are specific to communicable disease, they may also provide insight into a broader set of challenges that the world may face if nuclear weapons were ever to be used again.

Dealing with a pandemic is trivial compared to dealing with the aftermath of a nuclear incident or attack. Thermal injury, followed by radiation illness, not to mention the disruption to society and the impact on the environment, would dwarf the effect of COVID-19. The basic infrastructure of government, the criminal justice system, finance, telecommunications, and food supply could be severely disrupted, whereas they have remained largely intact during the current pandemic. But public concern over nuclear weapons has faded from a high point a generation ago. In part, this may be because of psychological biases that do not properly weight the impact of an event by its probability of occurring. Consequently, the public must once again be educated about and sensitized to nuclear risk.

The task of prevention and preparation cannot be left to governments alone. As with climate change, the whole of society must be engaged in pushing to transform how humans think about and manage our nuclear world. Only then will governments have the incentive to reduce systemic risk and plan for the unthinkable.

It is paradoxical that the prevention of nuclear war, so prominent in the public mind during the 1980s, has almost faded from view despite the continued proliferation of nuclear weapons and the means to deliver them; despite the unraveling of the nuclear arms control edifice that has undergirded international order since the 1960s; despite rising political tensions across the world; despite well-documented near misses resulting from accidents and miscalculation; and despite the risk that nuclear materials could fall into terrorist hands. During the Cold War, governments and civil society groups planned extensively for the impact of nuclear weapons, and the general public was encouraged to read or watch a series of “duck and cover” or “protect and survive” pamphlets and TV programs explaining what to do in the event of a nuclear war. Today that seems strange, even slightly comical. It should not be.

A sober analysis of the risks and consequences of nuclear catastrophe reveals that they are unacceptably high. But by learning lessons from the COVID-19 pandemic and applying them to the nuclear realm, engaged citizens can help to reduce those risks.

The consequences of nuclear attacks

The consequences of nuclear use depend on the size, number, and types of weapons, the altitude at which the explosion occurs, and population density. Alex Wellerstein’s NUKEMAP is an online tool that allows users to calibrate the gruesome effects of nuclear strikes of different magnitudes over any part of the world (Wellerstein 2020). As the tool makes clear, nuclear weapons destroy human life in three zones radiating out from the epicenter: the fireball; the shock wave; and the area of a residual radiation, whose direction depends on prevailing winds. As an example, the 455- kiloton W88 warhead currently deployed on missiles inside US nuclear-powered submarines, if detonated above London, would kill an estimated 675,000 people and injure over a million more, not taking into account radiation damage and subsequent fallout. The Tsar Bomba, a 50-megaton bomb released into the atmosphere by the Soviet Union in 1961 and the most powerful bomb ever to be tested, could have killed up to 7.6 million people and injured a further 4 million if detonated over New York City. During the Cold War, experts estimated that the use of just 1 percent of the world’s nuclear stockpile could kill about 56 million people and injure another 61 million (Daugherty, Levi, and Von Hippel 1986).

The medical effects of nuclear war are summarized in a report of that title, published by the British Medical Association’s Board of Science and Education in 1983 (British Medical Association 1983). Its conclusions derive from the generic effects of blast, thermal, and radiation injury, as well as from observations made following the bombings of Hiroshima and Nagasaki in 1945 and from over 2,000 nuclear tests (Simon and Bouville 2015). The fireball destroys everything at close hand, while at a greater distance thermal radiation causes flash burns and fires. A blast wave follows. Traveling at 90 meters per second, it wreaks havoc, crushing people in buildings, injuring them with flying debris, or choking them with dust. Survivors of thermal and blast injury, and those at greater distance from ground zero, are exposed to nuclear radiation and fallout. In the short term, they are at risk of radiation sickness, the main features of which are bone marrow suppression, gastro-intestinal symptoms, and skin damage. The severity of the disease depends on the radiation dose. Longer-term effects of radiation include reduced fertility, congenital abnormality (especially microcephaly), and cancer (especially of the thyroid).

However, just as the impact of a pandemic does not end with health effects, the impact of a nuclear strike would also go beyond the immediate death toll. Supply chains, including those for food and medicine, would be severely disrupted. Law and order would probably break down on a massive scale. There are also risks that are theoretical and controversial, but which would be cataclysmic if they occurred. Prominent among these is the risk of a so-called nuclear winter resulting from particles released into the high atmosphere (Sagan 1983; Scouras 2019).

Another theoretical risk is that of electromagnetic pulse disruption of electronic systems. Such an effect caused satellites in low orbit to fail following the high-altitude Starfish Prime nuclear test, carried out by the United States in 1962 (Plait 2012). Many writers have tried to imagine life in the aftermath of a nuclear strike, and the descriptions make the reader wonder if those killed immediately are not the fortunate ones (Whitcomb 2019; Witze 2020).

How might a nuclear incident arise?

Although the major nuclear powers have reduced stockpiles from their peaks in the 1980s, there are still over 13,000 nuclear weapons in the world today (Ploughshares Fund 2020). The bombs released in Japan in August 1945 relied entirely on fission, while in modern warheads fission is merely the detonator for an immensely more powerful fusion reaction. Several hundred of these weapons are held at high states of readiness for an attack. What might trigger their deployment? There are four main risks.

First is a planned attack. The 1945 attack on Japan is the only example to date. During the Cold War, potential belligerents were ostensibly restrained under the condition of mutual assured destruction, which itself relies on retaliation, rationality, and uncertainty about how the other side would act. Such gamesmanship may have been successful while there were only two actors, the United States and the Soviet Union, but it has become more complex and arguably more fragile in a world where nine states can deploy nuclear weapons, and where new flashpoints have emerged in East Asia, South Asia, and possibly the Middle East.

Second is miscalculation. There have been numerous nuclear near misses in our past: most famously, the near launch from a Russian nuclear submarine during the Cuban Missile crisis in 1962, and as a result of the NATO military exercise, code-named Able Archer, which led to a nuclear war scare in 1983. But also, more recently during the India–Pakistan Kargil war of 1999, just a year after both had conducted nuclear tests.

Third is an accident. It is at least conceivable that nuclear weapons could be used by accident, possibly through a computer malfunction or human error. Perhaps the best example of this would is the so-called “Petrov incident” in 1983, when scattered rays of sunlight tricked a Soviet alert system into thinking a US nuclear attack was incoming (Lewis et al. 2015).

Fourth is by non-state actors, such as terrorist groups. The chance of a nuclear detonation by a terrorist group may be limited; but perhaps more worrying is the possibility that by simulating an attack from one country they could provoke retaliation from another, or from some other interference that leads to nuclear use.

Most commentators think that miscalculation or accident is the most likely progenitor of a nuclear strike, by a considerable margin; if that is true, then nonuse of nuclear weapons for 75 years has been the result mostly of luck rather than judgment (Pelopidas 2017).

Quantifying the risk of nuclear events

The magnitude of the risk of a nuclear event is hard to estimate. The risk of a single incident, leading to the death of, say, one million people, might be as high as 50 percent over the next 50 years, according to one model (Barrett, Baum, and Hostetler 2013). Another widely cited figure is a 2 percent chance per year (Hellman 2008). A survey of experts found a wide range of estimates of the probability of nuclear war over a 10- year period; only one of the 79 respondents put the risk at zero percent, and 60 put it at over 10 percent (Lugar 2005).

The expected loss from a future event is the product of its probability and its impact, both of which could themselves be assigned probability distributions to represent the associated uncertainties. The impact could be calibrated in disability adjusted life years or even just life years lost. As a simple illustration, a 5 percent probability of an event with 50 million causalities results in an expected loss of 2.5 million (0.05 x 50 m) lives.

However, the skewed distribution of impact means the probability of losses that are orders of magnitude larger than this cannot be ignored. Figure 1 provides an example of the expected life years lost from a nuclear conflict by providing probability distributions based on estimates from the literature. In this example, the expected number of lives lost is 29 million, even though the median probability of a nuclear conflict is “only” 10 percent and the median number of lives lost is 1 million. By way of comparison, the World Health Organization estimated that climate change would be responsible for around 241,000 additional deaths each year to 2030 (or about 2.5 million over ten years) (World Health Organization 2014). Neither of these calculations take into account loss of life due to indirect economic effects. Nor do they include suffering caused by chronic illness and disability. In the case of nuclear exposure, this also includes terrible effects on unborn children. However, even without taking these considerations into account, it is clear that both nuclear war and climate change are huge threats to public health and wellbeing. But there is little reason to conclude that climate change is a greater hazard. The effects of nuclear war are immediate, whereas climate change provides plenty of warning, allowing infrastructure to be preserved, even if at high cost.

Public perceptions and social concern

A generation ago, nuclear risk was at the forefront of the public debate. Citizens across the globe were genuinely worried that a nuclear war might break out between East and West, and this spurred huge public protests and a strong anti-nuclear movement. However, today, the appreciation of nuclear risk appears much lower, with far less public concern beyond elite-level discussion and civil society activism. Notwithstanding the work of the International Physicians for the Prevention of Nuclear War (an international federation of medical groups), the International Campaign to Abolish Nuclear Weapons, the recent Humanitarian Initiative on Nuclear Weapons, and the 2017 Nuclear Ban Treaty, nuclear risks appear to have fallen below other global societal risks, such as climate change, and, following the outbreak of COVID19, global pandemics. Why has the risk of nuclear war almost dropped out of popular concern when there is little or no objective reason for citizens to lower their guard? There are four main reasons.

First is a failure to consider both the probability and magnitude of nuclear events. As the above calculations show, probability should not be considered in isolation from the magnitude of an event if it occurs. The expected loss should be kept in mind when assessing threats.

Second is the general public’s bandwidth for giving attention to important issues. There appears to be a limit to the number of issues that can rise to prominence at any one time; issues must compete for public and journalistic attention (Hilgartner and Bosk 1988). But other issues, important as they may be, should not crowd out the nuclear risk.

Third is the availability heuristic. People are more engaged by things they have experienced than things they must imagine. Expect public support for investment to prevent and prepare for pandemics in the near future. However, the hidden danger is often the greater danger, in part because it is hidden and less tangible.

Fourth is a sense of futility. Challenges such as climate change and pandemic prevention are perceived to be more “doable” in the sense that people feel they can influence the course of events. Such a sense of powerlessness may induce a nihilistic attitude. However, citizens are not powerless to reduce nuclear risk.

Learning nuclear lessons from COVID-19 and preparing for the unthinkable

The current COVID-19 crisis, in addition to serving as a timely reminder of the very personal nature of global catastrophic risk, can also shine light on the ongoing nuclear challenge that global society faces.

The first objective when dealing with global catastrophic risks, such as that posed by nuclear weapons, is the importance of prevention. It is easy to think that nuclear prevention differs from pandemic prevention in the sense that pandemics arise from the natural world while nuclear events are entirely human made. However, pandemics involve human actions at all levels, from the way the environment is managed (Brulliard 2020), through containment in facilities that experiment with modification of the viral genome, and through the nations and international agencies that respond to emerging threats. Both viral and nuclear risks can be mitigated by international co-operation. The risk of pandemics can be reduced through international agreement covering early reporting of communicable disease outbreaks. Delayed reporting resulted in delayed action in the case of COVID-19.

Worryingly, similar bilateral and multilateral agreements, supported by trust building, are eroding in the nuclear arena. Ensuring that the current global arms control architecture – including the Nuclear NonProliferation Treaty agreed in 1968 and the New START agreement between the United States and Russia that is due to expire next year – survives into a new era is essential. Likewise, continued international efforts to reduce the risks posed by nuclear terrorism through securing nuclear facilities and accounting for all fissile materials are also vital.

Genuine political commitment to nuclear disarmament would of course be the ultimate prevention mechanism, but whether nuclear disarmament is possible in our lifetimes is a moot point. Indeed, global engagement with nuclear disarmament appears to be on the wane even after the high point of agreement of the 2017 Nuclear Ban Treaty. Nevertheless, if the world cannot disarm, at least it could create a regime where all, or the great majority, of armaments are taken off high alert and various confidence building and risk reduction mechanisms are put in place, given the well-documented risks of accident or miscalculation. All these measures require strengthening international bodies that can carry out inspections and help overcome suspicion through increasing transparency. For example, governments will be more confident to reduce the high alert status of nuclear weapons if they can be assured that other governments are doing likewise.

If prevention is not possible, then attention must turn toward preparation. It has been argued that the world was not properly prepared for the current pandemic, from a lack of personal protective equipment to economic planning for lockdown, meaning that decisions had to be made on the fly. However, if governments were not prepared for the pandemic, then they are likely not prepared for other global disasters either, the most significant of which would arguably be a nuclear disaster.

Duncan Campbell’s 1982 book War Plan UK gives an unnerving insight into the limitations of planning for life after a nuclear attack even in an age where such an event was taken seriously (Campbell 1982). And it is not clear that much societal contingency planning beyond the continuity of government exists in most states today (see Graff 2017). COVID-19 has highlighted the enormous pressures on the health service, police officers, and other essential workers, and has shown that these workers can become ill or even die. Moreover, even if just one city was attacked by a nuclear weapon, it would be necessary for other parts of the country to come to its aid, and the government would have to step in to put emergency measures in place for the distribution of food and water, shelter, and healthcare.

Policy makers cannot just wring their hands and say how catastrophic it would be and hope for the best. The fact that it would be difficult to manage such a scenario is the very reason why the plans should be made. Such plans would have to involve the whole of society, just as they did in the 1960s. Citizens need to persuade their governments to spend money and energy on difficult questions. How to maintain food supplies? How to get money to people who need it? Who is an essential worker? Which industries or parts of society should be prioritized? What is the correct balance between state and private industry in the response? How much should the population be allowed to know? How far should human rights be suspended? What should the parts of the country that are functioning do to help those that are not?

The current COVID-19 crisis also provides insight into the challenges that citizens would face in the event of a nuclear attack (whether small or large in scale, or indeed just threatened). A nuclear crisis is likely to create far greater levels of panic, hoarding, and shortages of medical supplies than has COVID-19. There would be a rush to stockpile iodine, for example, to counter the effects of radiation on the thyroid, but also of the equipment necessary to treat burns or gain access to clean water. A nuclear attack would also almost certainly mean the curtailment of civil liberties, as well as lockdowns and restrictions on travel (both domestically and abroad). Rather than to prevent the spread of illness, this would be done to allow the authorities to try to manage the crisis and prevent lawlessness. It may even include martial law and possibly a restriction of citizens’ ability to access reliable information. To some extent, this is easier today with 24-hour television news reporting and myriad online resources to keep everyone up to date (assuming TV and radio transmission is still possible), but the flip side of this is that knowing what is real or believable is difficult (Lazer et al. 2018). This also highlights the importance of clear and unequivocal messaging on the part of trustworthy governments (another significant challenge highlighted by the response to COVID-19).

Perhaps the most important pieces of the nuclear risk puzzle are education and engagement. Notwithstanding the excellent work by organizations such as the Nuclear Threat Initiative, the public is probably less familiar with the basics of nuclear weapons and nuclear risks than at any point since the 1940s, so it is essential that more be done to educate the public about them, perhaps in a similar way to what has happened with climate change. With respect to engagement, a nuclear disaster, and certainly a nuclear war, would be a catastrophe that extended beyond borders, and while an immediate reaction might be to close borders and look inward, it is clear that any response would have to be global.

A nuclear wake-up call

In 1966 the BBC docudrama The War Game depicting a hypothetical nuclear attack on the United Kingdom was deemed so upsetting that it was initially banned from being broadcast. Two decades later, the films The Day After and Threads portrayed the harrowing impact of nuclear attacks on towns in the US Midwest and on Sheffield, England, respectively. Upsetting as these films may have been, they nevertheless played an important role in educating the public about nuclear risks. A generation later, in the midst of the challenges and politics of the modern world, people seem to have forgotten the dangers posed by nuclear weapons or are at best blissfully ignorant. It is essential, however unpleasant it may seem, that citizens think about the unthinkable and make a concerted effort to hopefully prevent, but in a worst-case scenario mitigate and manage, the threats posed by nuclear weapons. The world has survived for 75 years without the use of nuclear weapons in war, but this does not automatically mean that the same will be true in the future. That governments have avoided catastrophe thus far is, at least in part, due to luck. There is no reason to assume that this luck will hold out indefinitely.

There is a limit to how far governments are prepared to move without the support of their citizens. As was the case in the abolition of the slave trade two hundred years ago or with climate change today, the causal chain is often from citizen to government, rather than the other way around (Jennings 2013). Citizens should hold politicians to account. It is crucially important that scientists and other experts are humble about how much is known – or how much can be known. However, the gradual awakening to the dangers of climate change, and more recently virulent disease, shows that the public can absorb abstract ideas and incorporate them in their worldview beyond just reciting empty slogans. But a societal movement requires engagement from a broad swath of groups including the press, teachers, the judiciary, and humanitarian and religious groups to ensure that the issue of nuclear risk is placed at the center of the public agenda in a sober but serious way.

#### Even if growth is imperfect, the transition away fails.

Hubert Buch-Hansen 18. Associate Professor, Department of Business and Politics, Copenhagen Business School. “The Prerequisites for a Degrowth Paradigm Shift: Insights from Critical Political Economy.” *Ecological Economics* 146: 157-63. Emory Libraries.

Still, the degrowth project is nowhere near enjoying the degree and type of support it needs if its policies are to be implemented through democratic processes. The number of political parties, labour unions, business associations and international organisations that have so far embraced degrowth is modest to say the least. Economic and political elites, including social democratic parties and most of the trade union movement, are united in the belief that economic growth is necessary and desirable. This consensus finds support in the prevailing type of economic theory and underpins the main contenders in the neoliberal project, such as centre-left and nationalist projects. In spite of the world's multidimensional crisis, a pro-growth discourse in other words continues to be hegemonic: it is widely considered a matter of common sense that continued economic growth is required.

It is also noteworthy that economic and political elites, to a large extent, continue to support the neoliberal project, even in the face of its evident shortcomings. Indeed, the 2008 financial crisis did not result in the weakening of transnational financial capital that could have paved the way for a paradigm shift. Instead of coming to an end, neoliberal capitalism has arguably entered a more authoritarian phase (Bruff, 2014). The main reason the power of the pre-crisis coalition remains intact is that governments stepped in and saved the dominant fraction by means of massive bailouts. It is a foregone conclusion that this fraction and the wider coalition behind the neoliberal paradigm (transnational industrial capital, the middle classes and segments of organized labour) will consider the degrowth paradigm unattractive and that such social forces will vehemently oppose the implementation of degrowth policies (see also Rees, 2014: 97).

While degrowth advocates envision a future in which market forces play a less prominent role than they do today, degrowth is not an antimarket project. As such, it can attract support from certain types of market actors. In particular, it is worth noting that social enterprises, such as cooperatives (Restakis, 2010), play a major role in the degrowth vision. Such enterprises are defined by being ‘organisations involved at least to some extent in the market, with a clear social, cultural and/or environmental purpose, rooted in and serving primarily the local community and ideally having a local and/or democratic ownership structure’ (Johanisova et al., 2013: 11). Social enterprises currently exist at the margins of a system, in which the dominant type of business entity is profit-oriented, shareholder-owned corporations. The further dissemination of social enterprises, which is crucial to the transitions to degrowth societies, is – in many cases – blocked or delayed as a result of the centrifugal forces of global competition (Wigger and Buch-Hansen, 2013). Overall, social enterprises thus (still) constitute a social force with modest power.

Ougaard (2016: 467) notes that one of the major dividing lines in the contemporary transnational capitalist class is between capitalists who have a material interest in the carbon-based economy and capitalists who have a material interest in decarbonisation. The latter group, for instance, includes manufacturers of equipment for the production of renewable energy (ibid.: 467). As mentioned above, degrowth advocates have singled out renewable energy as one of the sectors that needs to grow in the future. As such, it seems likely that the owners of national and transnational companies operating in this sector would be more positively inclined towards the degrowth project than would capitalists with a stake in the carbon-based economy. Still, the prospect of the “green sector” emerging as a driving force behind degrowth currently appears meagre. Being under the control of transnational capital (Harris, 2010), such companies generally embrace the “green growth” discourse, which ‘is deeply embedded in neoliberal capitalism’ and indeed serves to adjust this form of capitalism ‘to crises arising from contradictions within itself’ (Wanner, 2015: 23).

In addition to support from the social forces engendered by the production process, a political project ‘also needs the political ability to mobilize majorities in parliamentary democracies, and a sufficient measure of at least passive consent’ (van Apeldoorn and Overbeek, 2012: 5–6) if it is to become hegemonic. As mentioned, degrowth enjoys little support in parliaments, and certainly the pro-growth discourse is hegemonic among parties in government.5 With capital accumulation being the most important driving force in capitalist societies, political decision-makers are generally eager to create conditions conducive to production and the accumulation of capital (Lindblom, 1977: 172). Capitalist states and international organisations are thus “programmed” to facilitate capital accumulation, and do as such constitute a strategically selective terrain that works to the disadvantage of the degrowth project.

The main advocates of the degrowth project are grassroots, small fractions of left-wing parties and labour unions as well as academics and other citizens who are concerned about social injustice and the environmentally unsustainable nature of societies in the rich parts of the world. The project is thus ideationally driven in the sense that support for it is not so much rooted in the material circumstances or short-term self-interests of specific groups or classes as it is rooted in the conviction that degrowth is necessary if current and future generations across the globe are to be able to lead a good life. While there is no shortage of enthusiasts and creative ideas in the degrowth movement, it has only modest resources compared to other political projects. To put it bluntly, the advocates of degrowth do not possess instruments that enable them to force political decision-makers to listen to – let alone comply with – their views. As such, they are in a weaker position than the labour union movement was in its heyday, and they are in a far weaker position than the owners and managers of large corporations are today (on the structural power of transnational corporations, see Gill and Law, 1989).

6. Consent

It is also safe to say that degrowth enjoys no “passive consent” from the majority of the population. For the time being, degrowth remains unknown to most people. Yet, if it were to become generally known, most people would probably not find the vision of a smaller economic system appealing. This is not just a matter of degrowth being ‘a missile word that backfires’ because it triggers negative feelings in people when they first hear it (Drews and Antal, 2016). It is also a matter of the actual content of the degrowth project.

Two issues in particular should be mentioned in this context. First, for many, the anti-capitalist sentiments embodied in the degrowth project will inevitably be a difficult pill to swallow. Today, the vast majority of people find it almost impossible to conceive of a world without capitalism. There is a ‘widespread sense that not only is capitalism the only viable political and economic system, but also that it is now impossible to even imagine a coherent alternative to it’ (Fisher, 2009: 2). As Jameson (2003) famously observed, it is, in a sense, easier to imagine the end of the world than it is to imagine the end of capitalism. However, not only is degrowth – like other anti-capitalist projects – up against the challenge that most people consider capitalism the only system that can function; it is also up against the additional challenge that it speaks against economic growth in a world where the desirability of growth is considered common sense.

Second, degrowth is incompatible with the lifestyles to which many of us who live in rich countries have become accustomed. Economic growth in the Western world is, to no small extent, premised on the existence of consumer societies and an associated consumer culture most of us find it difficult to completely escape. In this culture, social status, happiness, well-being and identity are linked to consumption (Jackson, 2009). Indeed, it is widely considered a natural right to lead an environmentally unsustainable lifestyle – a lifestyle that includes car ownership, air travel, spacious accommodations, fashionable clothing, an omnivorous diet and all sorts of electronic gadgets. This Western norm of consumption has increasingly been exported to other parts of the world, the result being that never before have so many people taken part in consumption patterns that used to be reserved for elites (Koch, 2012). If degrowth were to be institutionalised, many citizens in the rich countries would have to adapt to a materially lower standard of living. That is, while the basic needs of the global population can be met in a non-growing economy, not all wants and preferences can be fulfilled (Koch et al., 2017). Undoubtedly, many people in the rich countries would experience various limitations on their consumption opportunities as a violent encroachment on their personal freedom. Indeed, whereas many recognize that contemporary consumer societies are environmentally unsustainable, fewer are prepared to actually change their own lifestyles to reverse/address this.

At present, then, the degrowth project is in its “deconstructive phase”, i.e., the phase in which its advocates are able to present a powerful critique of the prevailing neoliberal project and point to alternative solutions to crisis. At this stage, not enough support has been mobilised behind the degrowth project for it to be elevated to the phases of “construction” and “consolidation”. It is conceivable that at some point, enough people will become sufficiently discontent with the existing economic system and push for something radically different. Reasons for doing so could be the failure of the system to satisfy human needs and/or its inability to resolve the multidimensional crisis confronting humanity. Yet, various material and ideational path-dependencies currently stand in the way of such a development, particularly in countries with large middle-classes. Even if it were to happen that the majority wanted a break with the current system, it is far from given that a system based on the ideas of degrowth is what they would demand.

#### Scenario 2 is Innovation:

#### Increased competition aligns innovation with profit motive and drives technological breakthroughs in every sector of the economy.

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The goal of antitrust policy is to protect and promote a vigorous competitive process. Effective rivalry spurs firms to introduce new and innovative products, as they seek to capture profitable sales from their competitors and to protect their existing sales from future challengers. In this fundamental way, competition promotes innovation. We apply this basic insight to the antitrust treatment of horizontal mergers and of exclusionary conduct by dominant firms. A merger between rivals internalizes business-stealing effects arising from their parallel innovation efforts and thus tends to depress innovation incentives. Merger-specific synergies, such as the internalization of involuntary spillovers or an increase in the productivity of R&D, may offset the adverse effect of a merger on innovation. We describe the possible effects of a merger on innovation by developing a taxonomy of cases, with reference to recent US and EU examples. A dominant firm may engage in exclusionary conduct to eliminate the threat from disruptive firms. This suppresses innovation by foreclosing disruptive rivals and by reducing the pressure to innovative on the incumbent. We apply this broad principle to possible exclusionary strategies by dominant firms.

I. Introduction

We write in praise of market disrupters—firms that shake up the status quo, threaten incumbent firms, and sometimes transform entire industries. Through this process, which Joseph Schumpeter famously called “creative destruction,” disruptive firms promote economic growth and bring the benefits of new technologies and new business practices and business models to consumers.

We focus on the impact of antitrust policy—known globally as competition policy—on innovation.1 Competition policy seeks to protect and promote a vigorous competitive process by which new ideas are transformed into realized consumer benefits. In this fundamental way, competition spurs innovation. The productivity and growth literature teach us that innovation is the primary driver of rising standards of living over time, so promoting innovation through effective competition policy is likely to be very consequential for economic growth and welfare.

Disruptive firms drive a significant amount of innovation.2 They do not use the same technology or business model as incumbents. They offer consumers a distinct value proposition, not simply lower prices. By making its offer to customers attractive in a new way, a disruptive firm can destroy a great deal of incumbent profit while creating a large amount of consumer surplus. The resulting churn in products and market shares, as new products enter and old ones exit, and as newer business methods and business models supplant older ones, represents a healthy competitive process. If that competitive process is slowed or biased by mergers or by exclusionary conduct, innovation is lessened and consumers are harmed. This same competitive process promotes the development and diffusion of best practices, including what might be termed reductions in X-inefficiency. The trade and productivity literature both convincingly demonstrate that firms vary significantly in their productivity levels and that stiffer competition reallocates sales to more productive firms. The diffusion of best practices also is promoted if sales are contestable, going to the better-performing firms.

Competition policy seeks to protect the competitive process by which disruptive firms challenge the status quo. Competition policy is agnostic regarding the type of firm or the type of innovation involved. Start-ups that grow rapidly can certainly be disruptive. Uber and Airbnb are prominent recent examples. But large established firms can also be disruptive, especially when they attack adjacent markets. Think of Walmart entering local retail markets, Microsoft Bing challenging Google in search, or Netflix producing its own video content.

In contrast, the role played by successful incumbent firms in their own core markets is deeply conflicted. On the one hand, process innovations that lower costs can be most valuable at the largest firms, and market leaders often invest substantial sums to introduce new generations of products. Examples abound: Intel developing a new generation of technology and building new fabs to manufacture microprocessors; Boeing developing a new generation of large commercial aircraft; and Verizon investing to build its 5G wireless network. In many industries experiencing rapid technological change, the biggest firms are also some of the most impressive innovators, as Schumpeter observed 75 years ago.3 This should not be surprising, given the economies of scale associated with R&D, especially in industries where developing the next-generation product or process requires investments of hundreds of millions of dollars and/or extensive experience with the current technology.4 On the other hand, a successful incumbent firm that is profiting greatly from the status quo has a powerful incentive to preserve those profits, and this can mean slowing down or blocking disruptive threats. Successful incumbents also may find it very difficult organizationally to invest in disruptive technologies. 5 Competition valuably increases the diversity of approaches taken to the development of new technology.

We stress in this article that innovation is best promoted when market leaders are allowed to exploit their competitive advantages while also facing pressure to perform coming from both conventional rivals and from disruptive entrants. These labels depend on context: the same firm can be a market leader in one area and a disruptive upstart in another. Market leaders may face competitive pressures to innovate coming from (a) other large firms in the same market, (b) other large firms in adjacent spaces, or (c) smaller, pesky disruptive firms. Casual empiricism indicates that all of these sources of competition are important in different settings. All have historically been protected using competition policy.

The central theme animating our analysis is that a market leader is best motivated to innovate if it fears losing its leadership position to a disruptive rival.6 Even a dominant incumbent will feel pressure to innovate if the bulk of tomorrow’s sales will be won by the firm that is most innovative, be that the incumbent or a disruptive challenger, and if other firms are in a position to leapfrog the current incumbent. Once one properly understands the dynamic nature of the competitive process, it becomes clear that greater rivalry—meaning greater contestability of tomorrow’s sales—leads to more innovation.7 The critical role of competition policy is thus to prevent today’s market leaders from using their market power to disable disruptive threats, either by acquiring would-be rivals or by using anticompetitive tactics to exclude them. Sections II and III discuss the treatment of horizontal mergers that may harm innovation. Section IV discusses the antitrust limits on the business conduct of dominant incumbent firms.

#### Expanding antitrust is necessary to sustain creative destruction. Only that preserves innovation leadership.

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The goal underpinning U.S. antitrust law is to promote competition that leads to lower prices and enhanced consumer welfare.

For years, antitrust agencies have approached this goal by focusing on short-term, static competition, which emphasizes achieving low prices in the here and now.

This narrow focus, however, has resulted in unnecessary conflict between the static competitive analysis deployed by antitrust regulators and the dynamic issues raised by intellectual property.

Fortunately, over the last few decades, a growing recognition has emerged among economists that antitrust laws must be recalibrated to preserve the incentive to innovate and promote the U.S. innovation economy.

These economists are calling for an antitrust framework that prioritizes dynamic over static competition — placing less weight on market concentration in the assessment of market power and more weight on assessing technological opportunity, innovation-driven competition and appropriate enterprise-level capabilities.

At the heart of this movement is the foundational principle, dating back to Joseph Schumpeter and Nobel Laureate economist Robert Solow, that innovation is the main driver of economic growth.

Indeed, given the strong economic evidence that innovation drives productivity, sharpens competition and creates new products, a serious consumer-oriented antitrust policy, with an intermediate-to-long-term orientation, necessarily must focus primarily on supporting and advancing innovation.

However, although antitrust agencies routinely claim to favor both innovation and competition, this has not always been the case.

For instance, during the previous administration, some agency heads unnecessarily generated tension between static competitive analysis — with its undue emphasis on achieving low prices in the short term — and the dynamic issues implicated by intellectual property and associated royalty payments.

Royalties, in the short run, raise prices of licensed goods relative to the prices that would prevail absent payments.

However, payments to licensors also support innovation by helping innovators achieve the economic returns necessary to draw forth the critical investment dollars needed to support research and development (R&D) and continuing innovation.

This model produces a continuous cycle of innovation in which innovators are properly incentivized to invent and reinvest their royalties into more R&D, which leads to new innovations and restarts the cycle.

A prime example of the dynamic benefits flowing from such an innovation ecosystem is 5G. This revolutionary technology promises the ability to connect to and control cities, automobiles, objects and devices, transforming a broad range of industries in the process.

Thanks to its private-sector top performers, the United States currently leads the world in 5G — a distinction that comes with an extraordinary opportunity for massive economic growth and increased consumer welfare.

However, the rigid application of an antitrust framework focused on short-term pricing, rather than on innovation as a critical driver of competition, could cause the United States to forfeit its 5G leadership position.

This would not only reduce consumer welfare but would pose a clear risk to U.S. national security — a fact recognized by U.S. national defense agencies in prohibiting a foreign company from acquiring Qualcomm, a U.S. technology company, because the proposed transaction imperiled Qualcomm’s 5G leadership position.

Recently, the U.S. Department of Justice (DOJ) has indicated that a course correction may be underway. In a series of speeches, Assistant Attorney General Makan Delrahim, head of the DOJ’s Antitrust Division, signaled that the focus of a sound antitrust analysis must be less on short-term pricing and more on the innovation and growth that delivers value to consumers over the longer term.

For example, in his speech before the U.S. Embassy in Beijing, Delrahim invoked “promoting dynamic competition” as a normative goal of competition regulators.

He also declared that “competition law enforcers around the world must give careful consideration to the interests that drive innovation, including by allowing innovators to reap the full rewards of their investment in research and development.” It appears that Delrahim correctly recognizes that innovation is the critical driver of competition.

While Delrahim’s leadership on this issue is admirable, officials at the Federal Trade Commission (FTC) regrettably have yet to follow the DOJ’s lead. The FTC continues to endorse outdated modes of competition regulation and policies that are not properly calibrated to promote dynamic competition and advance innovation.

In order to truly enhance consumer welfare over the long term, I hope the FTC soon will join hands with the DOJ and help move the United States toward a pro-innovation policy founded upon a dynamic competition paradigm.

For over 30 years, a small group of economists has been calling for a pivot in antitrust in favor of dynamic over static competition. With Delrahim at the helm of the DOJ’s Antitrust Division, we may soon witness such a pivot.

U.S. antitrust policy needs to adopt a deeper understanding of innovation processes and competition over the long run, and there needs to be greater policy coherence among antitrust, industrial and technology policies.

The dynamic competition paradigm is both the easiest and the best intellectual paradigm for the competition agencies and the courts to employ to free antitrust from its current outmoded framework. Indeed, prioritizing dynamic competition over its weaker sibling will enhance not just consumer welfare, but economic welfare, too.

#### Innovation is key to leadership and competitiveness.

Francis J. Gavinis 21. Giovanni Agnelli Distinguished Professor and the inaugural director of the Henry A. Kissinger Center for Global Affairs at Johns Hopkins School of Advanced International Studies. He is also the Chairman of the Board of Editors of the Texas National Security Review. “ECONOMICS AND U.S. NATIONAL SECURITY.” <https://warontherocks.com/2021/06/economics-and-u-s-national-security/>.

First, how will the United States respond to the ongoing transformation of the domestic and international economy? Economic success going forward will be less based on traditional measures and low value-added activities, such as agriculture, resource extraction, low-end services, and even mass industrial prowess. Growth will increasingly emerge from generating and implementing technological innovations, as well as from the ability to creatively finance them. New technological breakthroughs in AI and machine learning, quantum computing, automation and robotics, 3D printing and advanced manufacturing, biomedicine, nanotechnology, etc. have the potential to revolutionize fields ranging from energy and health to manufacturing and transportation. Will the United States generate and adapt to these innovations, while also providing its population with the skills necessary to thrive in this new world? Success in the technology and financial realm have also tended to increase inequality, while also worsening geographical divisions between innovation hubs (Boston, San Francisco, New York, Austin) and other parts of the country. Will the government devise wise policies to ameliorate these frictions without losing the benefits of innovation?

How this question is answered is largely a matter of domestic politics. Yet how it is answered will shape both America’s global competitiveness and its political and societal well-being.

Relatedly, will the United States reject globalization and turn inward? In many communities, intense globalization is associated with de-industrialization and offshoring, despair and the opioid crisis, debt and inequality, climate change, and the rise of China. The United States has, throughout its history, gone through periods where it has turned its gaze away from the international economy. These historical episodes have rarely ended happily. Is there a way to capture the benefits of globalization while minimizing the harmful excesses?

The third question concerns the future of America’s economic relationship to China. The argument for decoupling and reducing vulnerability to China is powerful. First, COVID-19 demonstrated the dangers of vulnerable supply chains. Second, it does not make sense to continue to enrich a current and future rival. Third, increasing automation and robotics means that labor cost differentials are a less compelling reason to offshore production. For those who are skeptical of the pacifying effects of interdependence and believe security concerns should always trump economic ones, pulling away from China’s economy is the obvious choice.

The problem is that left to its own devices, the American and Chinese economies won’t naturally decouple. General Motors sells more cars, and Apple has sold more iPhones, in China than in the United States. Supply chains remain deeply integrated, including on the high-end technology front. Dissolving those relationships will be costly. Trade today is less between countries than within firms, whose operations are global rather than national. Shared technology platforms increase productivity, which would be lost under decoupling.

Trade flows, however, do not begin to capture the deep integration between the two economies. The financial and monetary spheres are far more interconnected. Chinese companies are raising record amounts on Wall Street, while U.S. banks and financial firms increase their investment and business in China. Despite political strains over the past decade, direct investment and financing in both directions shows little signs of decreasing. Reversing economic interdependence — if that policy is chosen for national security purposes — will both be costly and require political will. It would also fully signal that the United States sees China not as a competitor or even a rival, but as a full-blown adversary.

What are the sources of innovation and adaptation, and what role will the national government play in facilitating creating, scaling up, and implementing new technologies? This is the fourth big question faced by the Biden administration, and the issue here will be shaped by its view of U.S. competition and antitrust policy. On the one hand, the recent computing and telecommunications revolution has revealed the power of companies that dominate networks and platforms. The United States has done very well in this new world, and there are important arguments that the government should applaud and support the success of American tech giants dominating the global economy. On the other hand, some experts question whether it is healthy from a competition, innovation, and fairness perspective to allow companies like Amazon, Apple, Google, and Microsoft to achieve such dominating market power. They harken back to the spirit of President Theodore Roosevelt and his controversial but popular program of trust-busting in the early 20th century. There are critical national security considerations to both views.

Relatedly, there is a long-debated question of the role the government should play in seeding, supporting, subsidizing, and even directing the private sector. The United States has long steered clear of national economic planning. Yet the Chinese government’s massive, directed investments and championing of its companies, both for economic and national security reasons, has caused many Americans to rethink their priors on the relationship between the state and the private sector. This is reflected in the impressive, bipartisan support for the Endless Frontier Act to support improved technological competitiveness vis-à-vis China.

The final question involves America’s role as the banker to the world. Will the United States continue in this role, and what will the consequences be? This question has two parts, the first involving international monetary policy, the second surrounding capital formation.

One of the most important global economic developments of the past 15 years has been the emergence of the Federal Reserve Bank as the lender of last resort, not just to the United States, but to the world. The Federal Reserve banking system demonstrated masterful adaptability and far-sighted innovation during both the 2008 financial crisis and the economic fallout from last year’s COVID-19 crisis that, in both cases, arguably prevented a global depression and increased its mandate well beyond securing the U.S. financial system. In the process, it quietly but significantly increased America’s already potent global monetary and financial power. Despite previous predictions to the contrary, it is and will remain for some time a dollar-dominated world. Will this increased monetary power marry up with America’s recent proclivity to deploy economic sanctions, and if so, will that add or diminish American economic influence over the long term?

Part of the answer will be shaped by the uncertain outcome of current economic policies. The United States is currently undergoing a consequential experiment, with relative loose fiscal and monetary policy leading to a rethinking of how much debt and liquidity the economy can contain. Will this produce destabilizing inflation and a return to 1970s stagflation? Or will this liquidity be efficiently absorbed into higher productivity, a reduction in inequality, and overall growth? Interest rates, both nationally and around the world, remain near historical lows, despite the surge in liquidity.

The second aspect to America’s global financial power comes in its world leading innovation, sophistication, and depth of its financial sector. In recent decades, New York City competed with Hong Kong and London as the best place to raise capital and list companies. As recently as a decade ago, New York’s competitors showed signs of taking the lead. Great Britain’s decision to leave the European Union and China’s decision to crack down on dissent in Hong Kong has moved the advantages back to the United States. In addition to the traditional methods of Wall Street finance and exchange listings, America’s innovative venture capital financing capabilities in Silicon Valley, Boston, Austin, and elsewhere provide important and impressive domestic and global advantages. Can they be maintained and expanded upon?

#### Failure to sustain innovation leadership makes a China war inevitable.

Hung Tran 21. Nonresident senior fellow at the Atlantic Council’s GeoEconomics Center, former executive managing director at the Institute of International Finance, and former deputy director at the International Monetary Fund. “Is the US-China strategic competition a cold war?” <https://www.atlanticcouncil.org/blogs/new-atlanticist/is-the-us-china-strategic-competition-a-cold-war/>.

The global economy has become more integrated, with China’s economy growing strongly—poised to soon take over the United States at market exchange rates and having already done so in terms of purchasing power parity. More importantly, China has become the top trading partner and creditor/investor for many countries. The size and penetration of the Chinese economy have rendered a strategy of containing China impractical and costly to all sides, and makes the US-China contention more protracted and difficult.

The West thus faces a dilemma: Efforts to decouple from China in order to limit its influence would hurt not only China but also Western countries and the global economy more broadly, but striking a trade deal with China to reduce tensions will likely help the Chinese economy perform better, making the strategic competition with Beijing more intractable.

The rivalry has slowly led to a bifurcation of the global economy, most discernible in high-tech areas such as the tension between digital authoritarianism and digital liberalism, artificial intelligence and surveillance technologies, satellite-based navigation for civilian and military uses, and 5G/6G telecommunications.

A balanced assessment

It’s important to remember that China has many weaknesses, including an aging population with a shrunken labor force, a secular decline in labor productivity, high levels of debt, environmental degradation, and social and economic inequalities. It is still an open question whether China can graduate from its old and trusted development model of mobilizing massive investment for exports to one driven by innovation—a model that tends not to thrive under political control.

However, it is equally important not to underestimate the domestic challenges facing the United States and several European countries. Confronted by aging populations and declining productivity, many affluent Western countries have been beset by populist backlashes against economic inequalities and social problems. Especially in the United States, the division has deepened to the extent that there is no shared perception of reality, let alone common ground for debate. This makes it difficult for the United States to build political consensus behind any sustained actions needed to deal with its challenges—even though the country has managed to overcome difficulties in the past and could do so again.

With or without the label “cold war,” the United States and China are locked in a protracted conflict over core national values, including economic and geopolitical interests. The fact that the Chinese economy is stronger than the Soviet Union’s decrepit economy, playing a key role in integrated global supply chains, while many Western countries suffer from internal divisions, makes the strategic competition more challenging for the West than the Cold War of the late twentieth century was. Of particular concern is the fact that the United States has suffered a steep fall in its Freedom House “Freedom in the World” score since 2010, denting much of its soft power. Consequently, the contestants in today’s conflict appear to be more evenly matched, making for a difficult struggle ahead—whatever you want to call it.

#### US-China competition isn’t defined by military strength, but relative innovation capacity. Outpacing China is the only way to prevent a war.

James Lewis 18. Senior vice president at the Center for Strategic and International Studies. “Technological Competition and China.” <https://www.csis.org/analysis/technological-competition-and-china>.

The United States and China are in a growing competition, perhaps verging on conflict, but it is not a nineteenth century competition between empires for control of territory and resources. Unlike great power competition in previous centuries, the focal point is not military strength or territorial expansion. This conflict is over control of the modern levers of power—global rules and institutions, standards, trade, and technology. The ability to create new technologies, particularly digital technologies (given their importance for politics, security, and economic growth) have become key factors in the U.S.-China relationship, which is marked by close commercial cooperation and deep governmental distrust. This disparity creates unavoidable tensions.

The link between technology, innovation, national security, and international power is now widely recognized. When Vladimir Putin says that the country that leads in artificial intelligence (AI) “will be the ruler of the world,” it is hyperbole, but hyperbole that confirms that political leaders recognize that the ability to innovate is a potent source of national power. In the digital age, national security and national power have different requirements shaped by technological change and cyberspace.

Innovation has become a central element of its international influence. This is not new—the U.S.-Soviet space race was a contest of the ability of different systems to produce new technologies, but those were unique government programs. Technological competition today is as much between companies as states. A country’s ability to innovate and produce advanced technologies provides economic strength, military power, and an intangible benefit of perceived leadership.

Both China and the United States have advantages and disadvantages in this contest, and while it is usual to focus on quantitative aspects—such as the number of engineers or patents and spending on research and development (R&D)—these are not the key determinants of technological competition between states. This competition is a contest of ideas on governance for investment, innovation, and the internet. The internet and global connectivity not only reshape the environment for competition but also create political and market forces that both nations find difficult to control.

#### That goes nuclear.

Graham Allison 17. American political scientist and professor at the John F. Kennedy School of Government at Harvard. “Destined for War: Can America and China Escape Thucydides's Trap?” Scribe Publications Pty Limited.

Two centuries ago, Napoleon warned, "Let China sleep; when she wakes, she will shake the world." Today China has awakened, and the world is beginning to shake. Yet many Americans are still in denial about what China's transfor- mation from agrarian backwater to "the biggest player in the history of the world" means for the United States. What is this book's Big Idea? In a phrase. Thucydidess Trap; When rising power threatens to displace a ruling power, alarm bells should sound: danger ahead. China and the United States are currently on a collision course for war-unless both parties take difficult and painful actions to avert it. As a rapidly ascending China challenges America's accustomed pre- dominance, these two nations risk falling into a deadly trap first identified the 'ancient' Greek historian Thucydides. Writing about a war that devastated the two leading city-states of classical Greece two and a half. millennia ago, he explained: "It was the rise of Athens and the fear that this instilled in Sparta that made war inevitable." That primal insight describes :1 perilous historical pattern. Reviewing the record of the past five hundred years, the Thucydides's Trap Project I direct at Harvard has found sixteen cases in which a major nation's rise has disrupted the position of a dominant state. In the most infamous example, an industrial Germany rattled Britain's established position at the top of the pecking order a century ago. The catastrophic outcome of their competition necessitated a new category of violent conflict: world war. Our research finds that twelve of these rivalries ended in war and four did not - not a comforting ratio for the twenty- first century's most important geopolitical contest. This is not a book about China. It is about the *impact* of a rising China on the US and the global order. For seven decades since World War II, a rules-based framework led by Washington has defined world order, producing an era without war among great powers. Most people now think of this as normal. Historians call it a rare "Long Peace." To- day, an increasingly powerful China is unraveling this order, throwing into question the peace generations have taken for granted. In 2015, the Atlantic published "The Thucydides Trap: Are the US and China headed for War?" In that essay I argued that this histori- cal metaphor provides the best lens available for illuminating relations between China and the US today. Since then, the concept has ignited considerable debate. Rather than face the evidence and reflect on the uncomfortable but necessary adjustments both sides might make, pol- icy wonlts and presidents alike have constructed a straw man around Thucydides's claim about "inevitability." They have then put a torch to it -arguing that war between Washington and Beijing is not predetermined. At their 2015 summit, Presidents Barack Obama and Xijinping discussed the Trap at length. Obama emphasized that despite the structural stress created by China's rise. "the two countries are capable of managing their disagreements." At the same time, they acknowledged that. in Xi's words. "should major countries time and again make the mistakes of strategic miscalculation, they might create such traps for themselves." I concur: war between the US and China is not inevitable. Indeed, Thucydides would agree that neither was war between Athens and Sparta. Read in context. it is clear that he meant his claim about inevitability as hyperbole: exaggeration for the purpose of emphasis. The point of Thucydides's Trap is neither fatalism nor pessimism. Instead. it points us beyond the headlines and regime rhetoric to recognize the tectonic structural stress that Beijing and Washington must master to construct a peaceful relationship. If Hollywood were making a movie pitting China against the United States on the path to war. central casting could not find two better leading actors than Xi jinping and Donald Trump. Each personifies his country's deep aspirations of national greatness. Much as Xi's appointment as leader (if China in 2012 accentuated the role of the rising power, America': election of Donald Trump in a campaign that vilified China promises a more vigorous response from the ruling power. As personalities, Trump and Xi could not be more different. As protagonists in a struggle to be number one. however, they share por- tentous similarities. Both - Are driven by .1 common ambition: to malte their nation great again. - Identify the nation ruled by the other as the principal obstacle to their dream. - Take pride in their own unique leadership capabilities. ' See themselves playing a central role in revitalizing their nation. ° Have announced daunting domestic agendas that call for radical changes. - Have fired up populist nationalist support to "drain the swamp" of corruption at home and confront attempts by each other to thwart their nation's historic mission. Will the impending clash between these two great nations lead to war? Will Presidents Trump and Xi, or their successors. follow in the tragic footsteps of the leaders of Athens and Sparta or Britain and Ger- many? Or will they find a way to avoid war as effectively as Britain and the US did a century ago or the US and the Soviet Union did through four decades of Cold War? Obviously, no one knows. We can be cer- tain, however, that the dynamic Thucydides identified will intensify in the years ahead. Denying Thucydides’s Trap does not make it less real. Recognizing it does not mean just accepting whatever happens. We owe it to future generations to face one of history’s most brutal tendencies head on and then do everything we can to defy the odds. h, if we only knew." That was the best the Gemian chancellor could offer. Even when a colleague pressed Theobald von Beth- mann Hollweg. he could not explain how his choices. and those of other European statesmen, had led to the most devastating war the world had seen to that point. By the time the slaughter of the Great War finally ended in 1918, the key players had lost all they fought for: the Austro-Hungarian Empire dissolved. the German kaiser ousted, the Russian tsar overthrown, France bled for a generation, and England shorn of its treasure and youth. And for what? If we only knew. Bethmann Hollweg's phrase haunted the president of the United States nearly half a century later. In 1962.]ohn F. Kennedy was forty- five years old and in his second year in oï¬‚ice, but still struggling to get his mind around his responsibilities commander in chief. He knew that his finger was on the button of a nuclear arsenal that could ltill hundreds of millions of human beings in a matter of minutes. But for what? A slogan at the time declared. "Better dead than red." Kennedy rejected that dichotomy as not just facile, but false. "Our goal," as he put it, had to be "not peace at the expense of freedom, but both peace and freedom." The question was how he and his administration could achieve both. As he vacationecl at the family compound on Cape Cod in the sum- mer of 1902, Kennedy found himself reading The Gun: q/'August, Bar- bara Tuchman's compelling account of the outbrealt of war in 1914. Tuclnnan traced the thoughts and actions of Germany's Kaiser Wil- helm and his chancellor Bethmann Hollweg. Britain's King George and his foreign secretary Edward Grey, Tsar Nicholas, Austro-Hungarian emperor Franz Joseph. and others as they sleepwalked into the abyss. Tuchman argued that none of these men understood the danger they faced. None wanted the war they got. Given the opportunity for a do- -mwm he made. Reflecting on his own responsibilities, Kennedy pledged that if he ever found himself facing his own responsibilities, Kennedy pledged that if ever found himself facing choices that could make the difference between catastrophic war and peace, he would be able to give history a better answer than Bethmann Holloweg’s. Kennedy had no inkling of what lay ahead. In October 1962, just two months after he read Tuchman's book, he faced off against Soviet leader Nikita Khrushchev in the most dangerous confrontation in hu- man history. The Cuban Missile Crisis began when the United States discovered the Soviets attempting to sneak nuclear-tipped missiles into Cuba, a mere ninety miles from Florida. The situation quickly esca- lated from diplomatic threats to an American blockade of the island, military mobilizations in both the US and USSR, and several high- stakes clashes. including the shooting down of an American U-2 spy plane over Cuba. At the height of the crisis, which lasted for a tense thirteen days. Kennedy confided to his brother Robert that he believed the chances it would end in nuclear war were "between one-in-three and even." Nothing historians have discovered since has lengthened ' those odds. Although he appreciated the dangers of his predicament. Kennedy repeatedly made choices he knew actually increased the risk of war, in- cluding nuclear war. He chose to confront Khrushchev publicly (rather than my to resolve the issue privately through diplomatic channels); to draw an unambiguous red line requiring the removal of Soviet missiles (rather than leave himself more wiggle room); to threaten air strikes to destroy the missiles (knowing this could trigger Soviet retaliation against Berlin); and finally, on the penultimate day of the crisis. to give Khrushchev a time-limited ultimatum (that. if rejected. would have re- quired the US to fire the first shot). In each of these choices, Kennedy understood that he was raising the risk that further events and choices by others beyond his control could lead to nuclear bombs destroying American cities. including Washing- ton, DC (where his family stayed throughout the ordeal). For example, when Kennedy elevated the alert level of the American nuclear arse- nal to Defcon II. he made US weapons less vulnerable to a preemptive Soviet attack but simultaneously relaxed a score of safety catches. At Defcon ll. German and Turkish pilots took their seats in NATO fighter bombers loaded with armed nuclear weapons less than two hours away from their targets in the Soviet Union. Since electronic locks on nu- clm weapons had not yet been invented, there was no physical or tech- nica barrier preventing a pilot from deciding to ï¬‚y to Moscow, drop a mic ar bomb, and start World War III. ith no way to wish away these "risks of the uncontrollable," Ken- ned ' and his secretary of defense, Robert McNamara, reached deeply into organizational procedures to minimize accidents or mistakes. De- spit those efforts, historians have identified more than a dozen close calls outside Kennedy's span of control that could have sparked a war. A US ntisubmarine campaign, For example, dropped explosives around Soviet submarines to force them to surface, leading a Soviet captain to believe he was under attack and almost fire his nuclear-armed torpe- does. In another incident, the pilot of a U-2 spy craft mistakenly ï¬‚ew over the Soviet Union, causing Khrushchev to fear that Washington was refining coordinates for a preemptive nuclear attack. If one of these actions had sparked a nuclear World War III. could\_]FK explain how his choices contributed to it? Could he give a better answer to an inquisi- tor's question than Bethmann Hollweg did? The complexity of causation in human affairs has vexed philoso- phers, jurists, and social scientists. In analyzing how wars break out, historians focus primarily on proximate or immediate causes. In the case of World War I, these include the assassination of the Hapsburg archduke Franz Ferdinand and the decision by Tsar Nicholas II to mo- bilize Russian forces against the Central Powers. If the Cuban Missile Crisis had resulted in war, the proximate causes could have been the Soviet submarine captain's decision to fire his torpedoes rather than al- low his submarine to sink, or a Turkish pilot's errant choice to fly his nuclear payload to Moscow. Proximate causes for war are undeniably important. But the founder of history believed that the most obvious causes for bloodshed mask even more significant ones. More import- ant than the sparks that lead to war, Thucydides teaches us, are the structural factors that lay its foundations: conditions in which other- wise manageable events can escalate with unforeseeable severity and produce unimaginable consequences. Tl-IUCYDIDES'S TRAP In the most frequently cited one-liner in the study of international re- lations, the ancient Greek historian Thucydides explained, "It was the rise of Athens and the fear that this instilled in Sparta that made war a} . I I .99 Tliucydides wrote about the Peloponnesian War, a conflict that en- gulfcd his homeland, the city-state of Athens, in the fifth century BCB, and which in time came to consume almost the entirety of ancient Greece. A former soldier. Thucydides watched as Athens challenged the dominant Greek power of the day, the martial city-state of Sparta. He observed the outbreak of armed hostilities between the two powers and detailed the fighting's horrific toll. He did not live to see its bitter end. when a weakened Sparta finally vanquished Athens. but it is just as well for him. While others identified an array of contributing causes of the Pelo- ponncsian War. Thucydides went to the heart of the matter. When he turned the spotlight on "the rise of Athens and the fear that this in- stilled in Sparta." he identified a primary driver at the root of some of history's most catastrophic and puzzling wars. Intentions aside, when a rising power threatens to displace a ruling power, the resulting structural stress makes a violent clash the rule, not the exception. It happened between Athens and Sparta in the fifth century ncia, between Germany and Britain a century ago. and almost led to war between the Soviet Union and the United States in the 1950s and 19605. Like so many others. Athens believed its advance to be benign. Over the half century that preceded the conï¬‚ict, it had emerged as a steeple of civilization. Philosophy, drama. architecture, democracy. history, and naval prowess-Athens had it all. beyond anything previously -s'eel'I'Imder the sun. Its rapid development began to threaten Sparta, which had grown accustomed to its position as the dominant power on the Peloponnese. As Athenian confidence and pride grew, so too did its demands for respect and expectations that arrangements be revised to reflect new realities of power. These were, Thucydides tells us, natural reactions to its changing station. How could Athenians not believe that their interests deserved more weight? How could Athenians not expect that they should have greater inï¬‚uence in resolving differences? But it was also natural. Thucydides explained. that Spartans should see the Athenian claims as unreasonable, and even ungrateful. Who, Spartans rightly asked. provided the security environment that allowed Athens to ï¬‚ourish? As Athens swelled with a growing sense of its own importance, and felt entitled to greater say and sway, Sparta reacted with insecurity. fear. and a determination to defend the status quo. Similar dynamics can be found in a host of other settings, indeed even in families. When a young man's adolescent surge poses the prospect that he will overshadow his older sibling (or even his father), what do we expect? Should the allocation of bedrooms. or closet space, or seat- ing be adjusted to reflect relative size as well as age? In alpha-dominated species like gorillas, as a potential successor grows larger and stronger, both the pack leader and the wannabe prepare for a showdown. In businesses, when disruptive technologies allow upstart companies like Apple. Google. or Uber to break quickly into new industries. the re- sult is often a bitter competition that forces established companies like : ifliiexpvlett-Packard, Microsoft. or taxi operators to adapt their business models -or perish. Thucydides's Trap refers to the natural, inevitable discombobulation that occurs when a rising power threatens to displace a ruling power. This can happen in any sphere. But its implications are most dangerous in international affairs. For just as the original instance of Thucydides's Trap resulted in a war that brought ancient Greece to its knees, this phenomenon has haunted diplomacy in the millennia since. Today it has set the world's two biggest powers on a path to a cataclysm nobody wants, bud which they may prove unable to avoid. ARE THE US AND CHINA DESTINED FOR WAR? The world has never seen anything like the rapid, tectonic shift in the global balance of power created by the rise of China. If the US were a corporation. it would have accounted for 50 percent of the global eco- nomic market in the years immediately after World War II. By 1980, that had declined to 22 percent. Three decades of double-digit Chi- nese growth has reduced that US share to 16 percent today. If current trends continue, the US share of global economic output will decline further over the next three decades to 'ust ll rcent. Over this same J P' criod, China's share of the global economy will have soared from 2 P 8 Y percent in 1980 to 18 percent in 2016, well on its way to 30 percent in 2040. China's economic development is transforming it into a formida- ble political and military competitor. During the Cold War. as the US mounted clumsy responses to Soviet provocations, a sign in the Penta- gon said: "lf we ever faced a real enemy, we would be in deep trouble." China is a serious potential enemy. The possibility that the United States and China could find them- selves at war appears as unlikely as it would be unwise. The centennials recalling World War l, however, have reminded us of man's capacity for folly. When we say that war is "inconceivable." is this a statement about what is possible in the world-or only about what our limited minds can conceive? As far ahead as the eye can see. the defining question about global order is whether China and the US can escape Thucydides's Trap. Most contests that fit this pattern have ended badly. Over the past five hun- drcd years, in sixteen cases a major rising power has threatened to dis- place a ruling power. In twelve of those, the result was war. The four cases that avoided this outcome did so only because of huge, painful adjustments in attitudes and actions on the part of challenger and chal- lenged alilte. The United States and China can likewise avoid war, but only if they can internalize two difficult truths. First. on the current trajectory. war between the US and China in the decades ahead is not just possible, but much more likely than currently recognized. Indeed. on the historical record. war lS IUOT? add to they h tainly major likely than not. By underestimating the danger, moreover, we the risk. If leaders in Beijing and Washington keep doing what ave done for the past decade. the US and China will almost cer- wind up at war. Second, war is not inevitable. History shows that ruling powers can manage relations with rivals. even those that threaten to overtake them, without triggering a war. The record of those successes, as well as the failures. offers many lessons for statesmen today. As George Santayana noted, only those who fail to study history are condemned to repeat it. The chapters that follow describe the origins of Thucydides's Trap, explore its dynamics. and explain its implications for the present con- test between the US and China. Part One provides a succinct summary of the rise of China. Everyone knows about China's growth but few have realized its magnitude or its consequences. To paraphrase former Czech president Vaclav Havel. it has happened so quickly that we have not yet had time to be astonished. Part Two locates recent developments in US-China relations on the broader canvas of history. This not only helps us understand current events. but also provides clues about where events are trending. Our review stretches back 2,500 years, to the time when the rapid growth of Athens shocked a dominant martial Sparta and led to the Pelopon- nesian War. Key examples from the past 500 years also provide insights into the ways in which the tension between rising and ruling powers can tilt the chessboard toward war. The closest analogue to the current standoff--Germany's challenge to Britain's ruling global empire be- fore World War I--should give us all pause. Part Three asks whether we should see current trends in America's relations with China as a gathering storm of similar proportions. Daily media reports of China's "aggressive" behavior and unwillingness to accept the "intemational rules-based order" established by the US af- -!El"W6l'l'd War I] describe incidents and accidents reminiscent of 1914. At the same time. a dose of self-awareness is due. If China were "just lilte us" when the US burst into the twentieth century brimming with confidence that the hundred years ahead would be an American era. the rivalry would be even more severe, and war even harder to avoid. If it actually followed in America's footsteps, we should expect to see Chi- nese troops enforcing Beijing's will from Mongolia to Australia, just as Theodore Roosevelt molded "our hemisphere" to his China is following a different trajectory than did the United States during its own surge to primacy. But in many aspects of China's rise, we can hear echoes. What does President Xi\_|inping's China want? In one line: to make China great again. The deepest aspiration of over a billion Chinese citizens is to make their nation not only rich, but also pow- erful. Indeed, their goal is a China so rich and so powerful that other nations will have no choice but to recognize its interests and give it the respect that it deserves. The sheer scale and ambition of this "China Dream" should disabuse us of any notion that the contest between (jliina and the United States will naturally subside as China becomes a "responsible stakeholder." This is especially so given what my former colleague Sam Huntington famously called a "clash of civilizations," a historical disjunction in which fundamentally different Chinese and American values and traditions make rapprochement between the two powers even more elusive. While resolution of the present rivalry may seem difficult to foresee. actual armed conflict appears distant. But is it? In truth, the paths to war are more varied and plausible (and even mundane) than we want to believe. From current confrontations in the South China Sea, the East China Sea, and cyberspace, to a trade conflict that spirals out of control, it is frighteningly easy to develop scenarios in which Ameri- can and Chinese soldiers are killing each other. Though none of these scenarios seem likely, when we recall the unintended consequences of the assassination of the Hapsburg archdulte or of l(hrushchev's nuclear adventure in Cuba, we are reminded of just how narrow the gap is be- tween "unlikely" and "impossible." Part Four explains why war is not inevitable. Most of the policy community and general public are naively complacent about the possi- bility of war. Fatalists. meanwhile, see an irresistible force rapidly ap- proaching an immovable object. Neither side has it right. If leaders in both societies will study the successes and failures of the past, they will find a rich source of clues from which to fashion a strategy that can meet each nation's essential interests without war. The return to prominence of a 5,000-year-old civilization with 1.4 billion people is not a problem to be fixed. It is a condin'on-a chronic condition that will have to be managed over a generation. Success will require not just a new slogan, more frequent presidential summits. or additional meetings of departmental working groups. Managing this relationship without war will demand sustained attention, week by Wcclc. at the highest levels in both governments. It will require a depth of mutual understanding not seen since the Henry Kissinger-Zhou En- lai conversations that reestablished US-China relations in the 19705. Most significant, it will mean more radical changes in attitudes and ac- tions by leaders and the public alilte than anyone has yet undertaken. To escape Thucydides's Trap. we must be willing to think the unthinkable -:md imagine the unimaginable. Avoiding Thucydides's Trap in this case will require nothing less than bending the arc of history.

#### Extinction outweighs---it’s the upmost moral evil and disavowal of the risk makes it more likely.

Burns 17 (Elizabeth Finneron-Burns is a Teaching Fellow at the University of Warwick and an Affiliated Researcher at the Institute for Futures Studies in Stockholm, What’s wrong with human extinction?, http://www.tandfonline.com/doi/pdf/10.1080/00455091.2016.1278150?needAccess=true, Canadian Journal of Philosophy, 2017)

Many, though certainly not all, people might believe that it would be wrong to bring about the end of the human species, and the reasons given for this belief are various. I begin by considering four reasons that could be given against the moral permissibility of human extinction. I will argue that only those reasons that impact the people who exist at the time that the extinction or the knowledge of the upcoming extinction occurs, can explain its wrongness. I use this conclusion to then consider in which cases human extinction would be morally permissible or impermissible, arguing that there is only a small class of cases in which it would not be wrong to cause the extinction of the human race or allow it to happen. 2.1. It would prevent the existence of very many happy people One reason of human extinction might be considered to be wrong lies in the value of human life itself. The thought here might be that it is a good thing for people to exist and enjoy happy lives and extinction would deprive more people of enjoying this good. The ‘good’ in this case could be understood in at least two ways. According to the first, one might believe that you benefit a person by bringing them into existence, or at least, that it is good for that person that they come to exist. The second view might hold that if humans were to go extinct, the utility foregone by the billions (or more) of people who could have lived but will now never get that opportunity, renders allowing human extinction to take place an incidence of wrongdoing. An example of this view can be found in two quotes from an Effective Altruism blog post by Peter Singer, Nick Beckstead and Matt Wage: One very bad thing about human extinction would be that billions of people would likely die painful deaths. But in our view, this is by far not the worst thing about human extinction. The worst thing about human extinction is that there would be no future generations. Since there could be so many generations in our future, the value of all those generations together greatly exceeds the value of the current generation. (Beckstead, Singer, and Wage 2013) The authors are making two claims. The first is that there is value in human life and also something valuable about creating future people which gives us a reason to do so; furthermore, it would be a very bad thing if we did not do so. The second is that, not only would it be a bad thing for there to be no future people, but it would actually be the worst thing about extinction. Since happy human lives have value, and the number of potential people who could ever exist is far greater than the number of people who exist at any one time, even if the extinction were brought about through the painful deaths of currently existing people, the former’s loss would be greater than the latter’s. Both claims are assuming that there is an intrinsic value in the existence of potential human life. The second claim makes the further assumption that the forgone value of the potential lives that could be lived is greater than the disvalue that would be accrued by people existing at the time of the extinction through suffering from painful and/or premature deaths. The best-known author of the post, Peter Singer is a prominent utilitarian, so it is not surprising that he would lament the potential lack of future human lives per se. However, it is not just utilitarians who share this view, even if implicitly. Indeed, other philosophers also seem to imply that they share the intuition that there is just something wrong with causing or failing to prevent the extinction of the human species such that we prevent more ‘people’ from having the ‘opportunity to exist’. Stephen Gardiner (2009) and Martin O’Neill (personal correspondence), both sympathetic to contract theory, for example, also find it intuitive that we should want more generations to have the opportunity to exist, assuming that they have worth-living lives, and I find it plausible to think that many other people (philosophers and non-philosophers alike) probably share this intuition. When we talk about future lives being ‘prevented’, we are saying that a possible person or a set of possible people who could potentially have existed will now never actually come to exist. To say that it is wrong to prevent people from existing could either mean that a possible person could reasonably reject a principle that permitted us not to create them, or that the foregone value of their lives provides a reason for rejecting any principle that permits extinction. To make the first claim we would have to argue that a possible person could reasonably reject any principle that prevented their existence on the grounds that it prevented them in particular from existing. However, this is implausible for two reasons. First, we can only wrong someone who did, does or will actually exist because wronging involves failing to take a person’s interests into account. When considering the permissibility of a principle allowing us not to create Person X, we cannot take X’s interest in being created into account because X will not exist if we follow the principle. By considering the standpoint of a person in our deliberations we consider the burdens they will have to bear as a result of the principle. In this case, there is no one who will bear any burdens since if the principle is followed (that is, if we do not create X), X will not exist to bear any burdens. So, only people who do/will actually exist can bear the brunt of a principle, and therefore occupy a standpoint that is owed justification. Second, existence is not an interest at all and a possible person is not disadvantaged by not being caused to exist. Rather than being an interest, it is a necessary requirement in order to have interests. Rivka Weinberg describes it as ‘neutral’ because causing a person to exist is to create a subject who can have interests; existence is not an interest itself.3 In order to be disadvantaged, there must be some detrimental effect on your interests. However, without existence, a person does not have any interests so they cannot be disadvantaged by being kept out of existence. But, as Weinberg points out, ‘never having interests itself could not be contrary to people’s interests since without interest bearers, there can be no ‘they’ for it to be bad for’ (Weinberg 2008, 13). So, a principle that results in some possible people never becoming actual does not impose any costs on those ‘people’ because nobody is disadvantaged by not coming into existence.4 It therefore seems that it cannot be wrong to fail to bring particular people into existence. This would mean that no one acts wrongly when they fail to create another person. Writ large, it would also not be wrong if everybody decided to exercise their prerogative not to create new people and potentially, by consequence, allow human extinction. One might respond here by saying that although it may be permissible for one person to fail to create a new person, it is not permissible if everyone chooses to do so because human lives have value and allowing human extinction would be to forgo a huge amount of value in the world. This takes us to the second way of understanding the potential wrongness of preventing people from existing — the foregone value of a life provides a reason for rejecting any principle that prevents it. One possible reply to this claim turns on the fact that many philosophers acknowledge that the only, or at least the best, way to think about the value of (individual or groups of) possible people’s lives is in impersonal terms (Parfit 1984; Reiman 2007; McMahan 2009). Jeff McMahan, for example, writes ‘at the time of one’s choice there is no one who exists or will exist independently of that choice for whose sake one could be acting in causing him or her to exist … it seems therefore that any reason to cause or not to cause an individual to exist … is best considered an impersonal rather than individual-affecting reason’ (McMahan 2009, 52). Another reply along similar lines would be to appeal to the value that is lost or at least foregone when we fail to bring into existence a next (or several next) generations of people with worth-living lives. Since ex hypothesi worth-living lives have positive value, it is better to create more such lives and worse to create fewer. Human extinction by definition is the creation of no future lives and would ‘deprive’ billions of ‘people’ of the opportunity to live worth-living lives. This might reduce the amount of value in the world at the time of the extinction (by killing already existing people), but it would also prevent a much vaster amount of value in the future (by failing to create more people). Both replies depend on the impersonal value of human life. However, recall that in contractualism impersonal values are not on their own grounds for reasonably rejecting principles. Scanlon himself says that although we have a strong reason not to destroy existing human lives, this reason ‘does not flow from the thought that it is a good thing for there to be more human life rather than less’ (104). In contractualism, something cannot be wrong unless there is an impact on a person. Thus, neither the impersonal value of creating a particular person nor the impersonal value of human life writ large could on its own provide a reason for rejecting a principle permitting human extinction. It seems therefore that the fact that extinction would deprive future people of the opportunity to live worth-living lives (either by failing to create either particular future people or future people in general) cannot provide us with a reason to consider human extinction to be wrong. Although the lost value of these ‘lives’ itself cannot be the reason explaining the wrongness of extinction, it is possible the knowledge of this loss might create a personal reason for some existing people. I will consider this possibility later on in section (d). But first I move to the second reason human extinction might be wrong per se. 2.2. It would mean the loss of the only known form of intelligent life and all civilization and intellectual progress would be lost A second reason we might think it would be wrong to cause human extinction is the loss that would occur of the only (known) form of rational life and the knowledge and civilization that that form of life has created. One thought here could be that just as some might consider it wrong to destroy an individual human heritage monument like the Sphinx, it would also be wrong if the advances made by humans over the past few millennia were lost or prevented from progressing. A related argument is made by those who feel that there is something special about humans’ capacity for rationality which is valuable in itself. Since humans are the only intelligent life that we know of, it would be a loss, in itself, to the world for that to end. I admit that I struggle to fully appreciate this thought. It seems to me that Henry Sidgwick was correct in thinking that these things are only important insofar as they are important to humans (Sidgwick 1874, I.IX.4).5 If there is no form of intelligent life in the future, who would there be to lament its loss since intelligent life is the only form of life capable of appreciating intelligence? Similarly, if there is no one with the rational capacity to appreciate historic monuments and civil progress, who would there be to be negatively affected or even notice the loss?6 However, even if there is nothing special about human rationality, just as some people try to prevent the extinction of nonhuman animal species, we might think that we ought also to prevent human extinction for the sake of biodiversity. The thought in this, as well as the earlier examples, must be that it would somehow be bad for the world if there were no more humans even though there would be no one for whom it is bad. This may be so but the only way to understand this reason is impersonally. Since we are concerned with wrongness rather than badness, we must ask whether something that impacts no one’s well-being, status or claims can be wrong. As we saw earlier, in the contractualist framework reasons must be personal rather than impersonal in order to provide grounds for reasonable rejection (Scanlon 1998, 218–223). Since the loss of civilization, intelligent life or biodiversity are per se impersonal reasons, there is no standpoint from which these reasons could be used to reasonably reject a principle that permitted extinction. Therefore, causing human extinction on the grounds of the loss of civilization, rational life or biodiversity would not be wrong. 2.3. Existing people would endure physical pain and/or painful and/or premature deaths Thinking about the ways in which human extinction might come about brings to the fore two more reasons it might be wrong. It could, for example, occur if all humans (or at least the critical number needed to be unable to replenish the population, leading to eventual extinction) underwent a sterilization procedure. Or perhaps it could come about due to anthropogenic climate change or a massive asteroid hitting the Earth and wiping out the species in the same way it did the dinosaurs millions of years ago. Each of these scenarios would involve significant physical and/or non-physical harms to existing people and their interests. Physically, people might suffer premature and possibly also painful deaths, for example. It is not hard to imagine examples in which the process of extinction could cause premature death. A nuclear winter that killed everyone or even just every woman under the age of 50 is a clear example of such a case. Obviously, some types of premature death themselves cannot be reasons to reject a principle. Every person dies eventually, sometimes earlier than the standard expected lifespan due to accidents or causes like spontaneously occurring incurable cancers. A cause such as disease is not a moral agent and therefore it cannot be wrong if it unavoidably kills a person prematurely. Scanlon says that the fact that a principle would reduce a person’s well-being gives that person a reason to reject the principle: ‘components of well-being figure prominently as grounds for reasonable rejection’ (Scanlon 1998, 214). However, it is not settled yet whether premature death is a setback to well-being. Some philosophers hold that death is a harm to the person who dies, whilst others argue that it is not.7 I will argue, however, that regardless of who is correct in that debate, being caused to die prematurely can be reason to reject a principle when it fails to show respect to the person as a rational agent. Scanlon says that recognizing others as rational beings with interests involves seeing reason to preserve life and prevent death: ‘appreciating the value of human life is primarily a matter of seeing human lives as something to be respected, where this involves seeing reasons not to destroy them, reasons to protect them, and reasons to want them to go well’ (Scanlon 1998, 104). The ‘respect for life’ in this case is a respect for the person living, not respect for human life in the abstract. This means that we can sometimes fail to protect human life without acting wrongfully if we still respect the person living. Scanlon gives the example of a person who faces a life of unending and extreme pain such that she wishes to end it by committing suicide. Scanlon does not think that the suicidal person shows a lack of respect for her own life by seeking to end it because the person whose life it is has no reason to want it to go on. This is important to note because it emphasizes the fact that the respect for human life is person-affecting. It is not wrong to murder because of the impersonal disvalue of death in general, but because taking someone’s life without their permission shows disrespect to that person. This supports its inclusion as a reason in the contractualist formula, regardless of what side ends up winning the ‘is death a harm?’ debate because even if death turns out not to harm the person who died, ending their life without their consent shows disrespect to that person. A person who could reject a principle permitting another to cause his or her premature death presumably does not wish to die at that time, or in that manner. Thus, if they are killed without their consent, their interests have not been taken into account, and they have a reason to reject the principle that allowed their premature death.8 This is as true in the case of death due to extinction as it is for death due to murder. However, physical pain may also be caused to existing people without killing them, but still resulting in human extinction. Imagine, for example, surgically removing everyone’s reproductive organs in order to prevent the creation of any future people. Another example could be a nuclear bomb that did not kill anyone, but did painfully render them infertile through illness or injury. These would be cases in which physical pain (through surgery or bombs) was inflicted on existing people and the extinction came about as a result of the painful incident rather than through death. Furthermore, one could imagine a situation in which a bomb (for example) killed enough people to cause extinction, but some people remained alive, but in terrible pain from injuries. It seems uncontroversial that the infliction of physical pain could be a reason to reject a principle. Although Scanlon says that an impact on well-being is not the only reason to reject principles, it plays a significant role, and indeed, most principles are likely to be rejected due to a negative impact on a person’s well-being, physical or otherwise. It may be queried here whether it is actually the involuntariness of the pain that is grounds for reasonable rejection rather than the physical pain itself because not all pain that a person suffers is involuntary. One can imagine acts that can cause physical pain that are not rejectable — base jumping or life-saving or improving surgery, for example. On the other hand, pushing someone off a cliff or cutting him with a scalpel against his will are clearly rejectable acts. The difference between the two cases is that in the former, the person having the pain inflicted has consented to that pain or risk of pain. My view is that they cannot be separated in these cases and it is involuntary physical pain that is the grounds for reasonable rejection. Thus, the fact that a principle would allow unwanted physical harm gives a person who would be subjected to that harm a reason to reject the principle. Of course the mere fact that a principle causes involuntary physical harm or premature death is not sufficient to declare that the principle is rejectable — there might be countervailing reasons. In the case of extinction, what countervailing reasons might be offered in favour of the involuntary physical pain/ death-inducing harm? One such reason that might be offered is that humans are a harm to the natural environment and that the world might be a better place if there were no humans in it. It could be that humans might rightfully be considered an all-things-considered hindrance to the world rather than a benefit to it given the fact that we have been largely responsible for the extinction of many species, pollution and, most recently, climate change which have all negatively affected the natural environment in ways we are only just beginning to understand. Thus, the fact that human extinction would improve the natural environment (or at least prevent it from degrading further), is a countervailing reason in favour of extinction to be weighed against the reasons held by humans who would experience physical pain or premature death. However, the good of the environment as described above is by definition not a personal reason. Just like the loss of rational life and civilization, therefore, it cannot be a reason on its own when determining what is wrong and countervail the strong personal reasons to avoid pain/death that is held by the people who would suffer from it.9 Every person existing at the time of the extinction would have a reason to reject that principle on the grounds of the physical pain they are being forced to endure against their will that could not be countervailed by impersonal considerations such as the negative impact humans may have on the earth. Therefore, a principle that permitted extinction to be accomplished in a way that caused involuntary physical pain or premature death could quite clearly be rejectable by existing people with no relevant countervailing reasons. This means that human extinction that came about in this way would be wrong. There are of course also additional reasons they could reject a similar principle which I now turn to address in the next section. 2.4. Existing people could endure non-physical harms I said earlier than the fact in itself that there would not be any future people is an impersonal reason and can therefore not be a reason to reject a principle permitting extinction. However, this impersonal reason could give rise to a personal reason that is admissible. So, the final important reason people might think that human extinction would be wrong is that there could be various deleterious psychological effects that would be endured by existing people having the knowledge that there would be no future generations. There are two main sources of this trauma, both arising from the knowledge that there will be no more people. The first relates to individual people and the undesired negative effect on well-being that would be experienced by those who would have wanted to have children. Whilst this is by no means universal, it is fair to say that a good proportion of people feel a strong pull towards reproduction and having their lineage continue in some way. Samuel Scheffler describes the pull towards reproduction as a ‘desire for a personalized relationship with the future’ (Scheffler 2012, 31). Reproducing is a widely held desire and the joys of parenthood are ones that many people wish to experience. For these people knowing that they would not have descendants (or that their descendants will endure painful and/or premature deaths) could create a sense of despair and pointlessness of life. Furthermore, the inability to reproduce and have your own children because of a principle/policy that prevents you (either through bans or physical interventions) would be a significant infringement of what we consider to be a basic right to control what happens to your body. For these reasons, knowing that you will have no descendants could cause significant psychological traumas or harms even if there were no associated physical harm. The second is a more general, higher level sense of hopelessness or despair that there will be no more humans and that your projects will end with you. Even those who did not feel a strong desire to procreate themselves might feel a sense of hopelessness that any projects or goals they have for the future would not be fulfilled. Many of the projects and goals we work towards during our lifetime are also at least partly future-oriented. Why bother continuing the search for a cure for cancer if either it will not be found within humans’ lifetime, and/or there will be no future people to benefit from it once it is found? Similar projects and goals that might lose their meaning when confronted with extinction include politics, artistic pursuits and even the type of philosophical work with which this paper is concerned. Even more extreme, through the words of the character Theo Faron, P.D. James says in his novel The Children of Men that ‘without the hope of posterity for our race if not for ourselves, without the assurance that we being dead yet live, all pleasures of the mind and senses sometimes seem to me no more than pathetic and crumbling defences shored up against our ruins’ (James 2006, 9). Even if James’ claim is a bit hyperbolic and all pleasures would not actually be lost, I agree with Scheffler in finding it not implausible that the knowledge that extinction was coming and that there would be no more people would have at least a general depressive effect on people’s motivation and confidence in the value of and joy in their activities (Scheffler 2012, 43). Both sources of psychological harm are personal reasons to reject a principle that permitted human extinction. Existing people could therefore reasonably reject the principle for either of these reasons. Psychological pain and the inability to pursue your personal projects, goals, and aims, are all acceptable reasons for rejecting principles in the contractualist framework. So too are infringements of rights and entitlements that we accept as important for people’s lives. These psychological reasons, then, are also valid reasons to reject principles that permitted or required human extinction.

#### Absent US leadership, China will fill-in the innovation vacuum---that causes an expansion of technology that undermines human rights, expands repression of minorities, and cements dangerous bioethics.

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Since the early days of the Cold War, the United States has led the world in technology. Over the course of the so-called American century, the country conquered space, spearheaded the Internet, and brought the world the iPhone. In recent years, however, China has undertaken an impressive effort to claim the mantle of technological leadership, investing hundreds of billions of dollars in robotics, artificial intelligence, microelectronics, green energy, and much more. Washington has tended to view Beijing’s massive technology investments primarily in military terms, but defense capabilities are merely one aspect of great-power competition today—little more than table stakes. Beijing is playing a more sophisticated game, using technological innovation as a way of advancing its goals without having to resort to war. Chinese companies are selling 5G wireless infrastructure around the world, harnessing synthetic biology to bolster food supplies, and racing to build smaller and faster microchips, all in a bid to grow China’s power.

In the face of China’s technological drive, U.S. policymakers have called for greater government action to protect the United States’ lead. Much of the conventional wisdom is sensible: boost R & D spending, ease visa restrictions and develop more domestic talent, and build new partnerships with industry at home and with friends and allies abroad. But the real problem for the United States is much deeper: a flawed understanding of which technologies matter and of how to foster their development. As national security assumes new dimensions and great-power competition moves into different domains, the government’s thinking and policies have not kept pace. Nor is the private sector on its own likely to meet every technological need that bears on the country’s security.

In such an environment, Washington needs to broaden its horizons and support a wider range of technologies. It needs to back not only those technologies that have obvious military applications, such as hypersonic flight, quantum computing, and artificial intelligence, but also those traditionally thought of as civilian in nature, such as microelectronics and biotechnology. Washington also needs to help vital nonmilitary technologies make the transition to commercial success, stepping in with financing where the private sector will not.

AMERICA’S INNOVATION CHALLENGE

In the early decades of the Cold War, the United States spent billions of dollars dramatically expanding its scientific infrastructure. The Atomic Energy Commission, formed in 1946, assumed responsibility for the wartime labs that had pioneered nuclear weapons, such as the Oak Ridge National Laboratory, the headquarters of the Manhattan Project, and went on to fund academic research centers, such as the Lawrence Livermore National Laboratory. The Department of Defense, founded in 1947, was given its own massive research budget, as was the National Science Foundation, established in 1950. After the Soviets launched the Sputnik satellite, in 1957, Washington created the National Aeronautics and Space Administration, or NASA, to win the space race, as well as what would become the Defense Advanced Research Projects Agency, which was tasked with preventing a future technological surprise. By 1964, research and development accounted for 17 percent of all discretionary federal spending.

Partnering closely with academia and companies, the government funded a large variety of basic research—that is, research without a specific end use in mind. The goal was to build a technological foundation, defined primarily as conventional and nuclear defense capabilities, to ensure the country’s security. The research proved astonishingly successful. Government investment spawned cutting-edge capabilities that undergirded the United States’ military superiority, from supersonic jets to nuclear-powered submarines to guided missiles. The private sector, for its part, got to capitalize on the underlying intellectual property, turning capabilities into products and products into companies. GPS-enabled technologies, airbags, lithium batteries, touchscreens, voice recognition—all got their start thanks to government investment.

Yet over time, the government lost its lead in innovation. In 1964, the U.S. government was spending 1.86 percent of GDP on R & D, but by 1994, that share had fallen to 0.83 percent. During that same period, U.S. corporate R & D investment as a percentage of GDP nearly doubled. The numbers tell only half the story. Whereas much of the government’s R & D investment was aimed at finding new, game-changing discoveries, corporate R & D was mostly devoted to incremental innovation. The formula for growing revenue, the private sector realized, was to expand on existing products, adding functionality or making something faster, smaller, or more energy efficient. Companies focused on nearer-term technologies with commercial promise, rather than broad areas of inquiry that might take decades to bear fruit.

Increasingly, the most innovative R & D was taking place not in the labs of large corporations but at nimbler, privately funded startups, where venture capital investors were willing to tolerate more risk. Modern venture capital firms—partnerships that invest in early-stage companies—first arose in the 1970s, leading to early successes such as Apple and Microsoft, but it wasn’t until the dot-com bubble of the 1990s that this style of investment really took off. If the first phase of R & D outsourcing was from government labs to corporate America, this was the second phase: away from big businesses and toward small startups. Large companies began to spend less on internal R & D and more on what they called “corporate development,” or acquiring smaller, venture-backed companies with promising technologies.

The rise of venture capitalism created a great deal of wealth, but it didn’t necessarily further U.S. interests. Venture capital firms were judged by their ability to generate outsize returns within a ten-year window. That made them less interested in things such as microelectronics, a capital-intensive sector where profitability arrives in decades more so than years, and more interested in software companies, which need less capital to get going. The problem is that the companies receiving the most venture capital funding have been less likely to pursue national security priorities. When the American venture capital firm Accel hit the jackpot by investing early in Rovio Entertainment, the Finnish video game company behind the mobile app Angry Birds, it may have been a triumph for the firm, but in no way did it further U.S. interests.

Meanwhile, government funding of research continued its decline relative both to GDP and to R & D spending in the private sector. The Department of Defense retained the single biggest pot of federal research funding, but there was less money overall, and it became more dispersed across various agencies and departments, each pursuing its own priorities in the absence of a national strategy. As the best researchers were lured to the private sector, the government’s in-house scientific expertise atrophied. Once close relationships between private companies and Washington also suffered, as the federal government was no longer a major customer for many of the most innovative firms. U.S. agencies were rarely the first to buy advanced technology, and smaller startups generally lacked the lobbyists and lawyers needed to sell it to them anyway.

Globalization also drove a wedge between corporations and the government. The American market came to look less dominant in an international context, with the huge Chinese consumer market exerting a particularly powerful pull. Corporations now had to think of how their actions might look to customers outside the United States. Apple, for example, famously refused to unlock iPhones for the FBI, a decision that probably enhanced its brand internationally.

Further complicating matters, innovation itself was upending the traditional understanding of national security technology. More and more, technology was becoming “dual use,” meaning that both the civilian and the military sectors relied on it. That created new vulnerabilities, such as concerns about the security of microelectronic supply chains and telecommunications networks. Yet even though civilian technologies were increasingly relevant for national security, the U.S. government wasn’t responsible for them. The private sector was, and it was innovating at a rapid clip with which the government could barely keep pace. Taken together, all these trends have led to a concerning state of affairs: the interests of the private sector and the government are further apart than ever.

THE CHINESE JUGGERNAUT

The changes in American innovation would matter less if the world had remained unipolar. Instead, they occurred alongside the rise of a geopolitical rival. Over the past two decades, China has evolved from a country that largely steals and imitates technology to one that now also improves and even pioneers it. This is no accident; it is the result of the state’s deliberate, long-term focus. China has invested massively in R & D, with its share of global technology spending growing from under five percent in 2000 to over 23 percent in 2020. If current trends continue, China is expected to overtake the United States in such spending by 2025.

Central to China’s drive has been a strategy of “military-civil fusion,” a coordinated effort to ensure cooperation between the private sector and the defense industry. At the national, provincial, and local levels, the state backs the efforts of military organizations, state-owned enterprises, and private companies and entrepreneurs. Support might come in the form of research grants, shared data, government-backed loans, or training programs. It might even be as simple as the provision of land or office space; the government is creating whole new cities dedicated solely to innovation.

China’s investment in 5G technology shows how the process works in practice. Equipment for 5G makes up the backbone of a country’s cellular network infrastructure, and the Chinese company Huawei has emerged as a world leader in engineering and selling it—offering high-quality products at a lower price than its Finnish and South Korean competitors. The company has been buoyed by massive state support—by The Wall Street Journal’s count, some $75 billion in tax breaks, grants, loans, and discounts on land. Huawei has also benefited from China’s Belt and Road Initiative, which provides generous loans to countries and Chinese companies to finance infrastructure construction.

Massive state investments in artificial intelligence have also paid off. Chinese researchers now publish more scientific papers in that field than American ones do. Part of this success is the result of funding, but something else plays a big role: access to enormous amounts of data. Beijing has fueled the rise of powerhouse companies that sweep up endless information about their users. These include Alibaba, an e-commerce giant; Tencent, which developed the all-purpose WeChat app; Baidu, which began as a search engine but now offers a range of online products; DJI, which dominates the consumer drone market; and SenseTime, which provides facial recognition technology for China’s video surveillance network and is said to be the world’s most valuable artificial intelligence company. As a matter of law, these companies are required to cooperate with the state for intelligence purposes, a broad mandate that is almost certainly used to force companies to share data for many other reasons.

That information increasingly involves people living outside China. Chinese companies have woven a global web of data-gathering apps that collect foreigners’ private information about their finances, their search history, their location, and more. Those who make a mobile payment through a Chinese app, for example, could have their personal data routed through Shanghai and added to China’s growing trove of knowledge about foreign nationals. Such information no doubt makes it easier for the Chinese government to track, say, an indebted Western bureaucrat who could be convinced to spy for Beijing or a Tibetan activist who has taken refuge abroad.

China’s hunger for data extends to some of the most personal information imaginable: our own DNA. Since the COVID-19 pandemic began, BGI—a Chinese genome-sequencing company that began as a government-funded research group—has broken ground on some 50 new laboratories abroad designed to help governments test for the virus. China has legitimate reasons to build these labs, but it also has an ugly record of forcibly collecting DNA data from Tibetans and Uighurs as part of its efforts to monitor these minorities. Given that BGI runs China’s national library of genomics data, it is conceivable that through BGI testing, foreigners’ biological data might end up in that repository.

Indeed, China has shown great interest in biotechnology, even if it has yet to catch up to the United States. Combined with massive computing power and artificial intelligence, innovations in biotechnology could help solve some of humanity’s most vexing challenges, from disease and famine to energy production and climate change. Researchers have mastered the gene-editing tool CRISPR, allowing them to grow wheat that resists disease, and have managed to encode video in the DNA of bacteria, raising the possibility of a new, cost-effective method of data storage. Specialists in synthetic biology have invented a new way of producing nylon—with genetically engineered microorganisms instead of petrochemicals. The economic implications of the coming biotechnology revolution are staggering: the McKinsey Global Institute has estimated the value of biotechnology’s many potential applications at up to $4 trillion over the next ten to 20 years.

Like all powerful technologies, however, biotechnology has a dark side. It is not inconceivable, for example, that some malicious actor could create a biological weapon that targeted a specific ethnic group. On controversial questions—such as how much manipulation of the human genome is acceptable—countries will accept different degrees of risk in the name of progress and take different ethical positions. The country that leads biotechnology’s development will be the one that most profoundly shapes the norms and standards around its use. And there is reason to worry if that country is China. In 2018, the Chinese scientist He Jiankui genetically engineered the DNA of twin babies, prompting an international uproar. Beijing portrayed him as a rogue researcher and punished him. Yet the Chinese government’s disdain for human rights, coupled with its quest for technological supremacy, suggests that it could embrace a lax, even dangerous approach to bioethics.

THINKING BIGGER

Washington has monitored China’s technological progress through a military lens, worrying about how it contributes to Chinese defense capabilities. But the challenge is much broader. China’s push for technological supremacy is not simply aimed at gaining a battlefield advantage; Beijing is changing the battlefield itself. Although commercial technologies such as 5G, artificial intelligence, quantum computing, and biotechnology will undoubtedly have military applications, China envisions a world of great-power competition in which no shots need to be fired. Technological supremacy promises the ability to dominate the civilian infrastructure on which others depend, providing enormous influence. That is a major motivation behind Beijing’s support for high-tech civilian infrastructure exports. The countries buying Chinese systems may think they are merely receiving electric grids, health-care technology, or online payment systems, but in reality, they may also be placing critical national infrastructure and citizens’ data in Beijing’s hands. Such exports are China’s Trojan horse.

Despite the changing nature of geopolitical competition, the United States still tends to equate security with traditional defense capabilities. Consider microelectronics. They are critical components not only for a range of commercial products but also for virtually every major defense system, from aircraft to warships. Because they will power advances in artificial intelligence, they will also shape the United States’ future economic competitiveness. Yet investment in microelectronics has fallen through the cracks. Neither the private sector nor the government is adequately funding innovation—the former due to the large capital requirements and long time horizons involved and the latter because it has focused more on securing current supplies than on innovating. Although China has had a hard time catching up to the United States in this area, it is only a matter of time before it moves up the microelectronics value chain.

Another casualty of the United States’ overly narrow conception of security and innovation is 5G technology. By dominating this market, China has built a global telecommunications network that can serve geopolitical purposes. One fear is that Beijing could help itself to data running on 5G networks. Another is the possibility that China might sabotage or disrupt adversaries’ communications networks in a crisis. Most U.S. policymakers failed to predict the threat posed by Chinese 5G infrastructure. It wasn’t until 2019 that Washington sounded the alarm about Huawei, but by then, there was little it could do. U.S. companies had never offered an end-to-end wireless network, instead focusing on manufacturing individual components, such as handsets and routers. Nor had any developed its own radio access network, a system for sending signals across network devices that is needed to build an end-to-end 5G system like that offered by Huawei and a few other companies. As a result, the United States found itself in an absurd situation: threatening to end intelligence cooperation if close allies adopted Huawei’s 5G technology without having an attractive alternative to offer.

Digital infrastructure may be today’s battle, but biotechnology will likely be the next. Unfortunately, it, too, is not considered a priority within the U.S. government. The Department of Defense has understandably shown little interest in it. Part of the explanation for that lies in the fact that the United States, like many other countries, has signed a treaty renouncing biological weapons. Still, biotechnology has other implications for the Pentagon, from changing manufacturing to improving the health of service personnel. More important, any comprehensive assessment of the national interest must recognize biotechnology’s implications for ethics, the economy, health, and planetary survival.

Because so many of the gaps in U.S. innovation can be traced back to a narrow view of the national interest and which technologies are needed to support it, the Biden administration’s first step should be to expand that understanding. Officials need to appreciate both the threats and the opportunities of the latest technologies: the havoc that could be wreaked by a paralyzed 5G network or unscrupulous genetic engineering, as well as the benefits that could come from sustainable energy sources and better and more efficient health care.

The Biden administration’s second step should be to create a process for aligning government investments with national priorities. Today, federal funding is skewed toward military capabilities. This reflects a political reality: the Pentagon is the rare part of the government that reliably receives bipartisan budgetary support. Fighter jets and missile defense, for example, are well funded, whereas pandemic preparedness and clean energy get short shrift. But setting the right national technological priorities raises questions that can be answered only by making judgments about the full range of national needs. What are the most important problems that technology can help solve? Which technologies have the power to solve only one problem, and which might solve multiple problems? Getting the answers to such questions right requires taking a truly national perspective. The current method doesn’t do so.

A properly run process would begin with what national security professionals call a “net assessment”—in this case, an analysis of the state of global technological progress and market trends to give policymakers the information necessary to work from a shared baseline. To be actionable, the process would establish a handful of near- and long-term priorities. A compelling candidate for long-term investment, for instance, might be microelectronics, which are foundations for both military and civilian innovation but have difficulty attracting private investment dollars. Another long-term priority might be biotechnology, given its importance for the economy and the future of humanity. As for short-term priorities, the U.S. government might consider launching an international effort to combat disinformation operations or to promote 5G innovation. Whatever the specific priorities chosen, the important thing is that they be deliberate and clear, guiding the United States’ decisions and signaling its aspirations.

A MARKET MINDSET

Supporting those priorities is another matter altogether. The current approach—with the government funding only limited research and the private sector taking care of commercializing the results—isn’t working. Too much government-funded research remains locked in the lab, unable to make the leap to commercial viability. Worse, when it manages to leave U.S. government labs, it often ends up in foreign hands, depriving the United States of taxpayer-financed intellectual property.

The U.S. government will need to take a more active role in helping research make it to the market. Many universities have created offices that focus on commercializing academic research, but most federal research institutions have not. That must change. In the same spirit, the U.S. government should develop so-called sandboxes—public-private research facilities where industry, the academy, and the government can work together. In 2014, Congress did just that when it established Manufacturing USA, a network of facilities that conduct research into advanced manufacturing technologies. A similar initiative for microelectronics has been proposed, and there is no reason not to create additional sandboxes in other areas, too.

The U.S. government could also help with commercialization by building national data sets for research purposes, along with improved privacy protections to reassure the people whose information ends up in them. Such data sets would be particularly useful in accelerating progress in the field of artificial intelligence, which feeds off massive quantities of data—something that only the government and a handful of big technology companies currently possess. Success in synthetic biology, along with wider medical research, will also depend on data. Thus, the U.S. government should increase the quantity and diversity of the data in the National Institutes of Health’s genome library and curate and label that information so that it can be used more easily.

All this help with commercialization will be for naught, however, if the startups with the most promising technologies for national security cannot attract enough capital. Some of them run into difficulties at the early and late stages of growth: in the beginning, they have a hard time courting investors willing to make high-risk bets, and later on, when they are ready to expand, they find it difficult to attract investors willing to write large checks. To fill the gaps at both stages, the U.S. government needs its own investment vehicles.

We work at the parent company of In-Q-Tel, which offers a promising model for early-stage investment. Created in 1999 by the CIA, In-Q-Tel is an independent, not-for-profit firm that invests in technology startups that serve the national interest. (One early recipient of In-Q-Tel’s investment was Keyhole, which became the platform for Google Earth.) Now also funded by the Department of Homeland Security, the Department of Defense, and other U.S. agencies, In-Q-Tel identifies and adapts innovative technologies for its government customers. Compared with a federal agency, a private, not-for-profit firm can more easily attract the investment and technology talent required to make informed investments. There is every reason to take this model and apply it to broader priorities. Even just $100 million to $500 million of early-stage funding per year—a drop in the bucket of the federal budget—could help fill the gap between what the private sector is providing and what the nation needs.

For the later stage, policymakers could draw inspiration from the U.S. International Development Finance Corporation, the federal agency responsible for investing in development projects abroad, which in 2018 was first authorized to make equity investments. A late-stage investment fund could be structured as an arm of that agency or as a fully independent, not-for-profit private entity funded by the government. Either way, it would provide badly needed capital to companies ready to scale up their operations. Compared with early-stage government support, late-stage government support would have to be greater, in the range of $1 billion to $5 billion annually. To expand the impact of this government investment, both the early- and the late-stage funds should encourage “sidecar” investments, which would allow profit-seeking firms and individuals to join the government in making, and potentially profiting from, technology bets.

Government-sponsored investment funds like these would not only fill critical gaps in private-sector investment; they would also allow taxpayers to share in the success of research their money has funded. Currently, most government funding for technology comes in the form of grants, such as the Small Business Innovation Research grants administered by the Small Business Administration; this is true even of some programs that are billed as investment funds. This means that taxpayers foot the bill for failures but cannot share in the success if a company makes it big. As the economist Mariana Mazzucato has pointed out in these pages, “governments have socialized risks but privatized rewards.”

Not-for-profit investment vehicles working on behalf of the government would have another benefit: they would allow the United States to play offense when it comes to technological competition. For too long, it has played defense. For example, it has banned the export of sensitive technology and restricted foreign investment that might pose a national security risk—even though these actions can harm U.S. businesses and do nothing to promote innovation. Supporting commercialization with government-sponsored equity investment will not be cheap, but some of the upfront costs would likely be regained and could be reinvested. There are also nonmonetary returns: investing in national priorities, including infrastructure that could be exported to U.S. allies, would enhance the United States’ soft power.

INNOVATION EVER AFTER

President Joe Biden has pledged to “build back better” and restore the United States’ global leadership. On the campaign trial, he laid out promising proposals to promote American innovation. He called for dramatically boosting federal R & D spending, including some $300 billion to be focused on breakthrough technologies to enhance U.S. competitiveness. That is a good start, but he could make this drive far more effective if he first created a rigorous process for identifying top technological priorities. Biden said he supports “a scaled-up version” of the Small Business Innovation Research grants and has backed “infrastructure for educational institutions and partners to expand research.” Even greater opportunity lies in filling the gaps in private-sector investment and undertaking a long-overdue expansion of government support for commercialization.

On innovation, if the United States opts for just more of the same, its economy, its security, and its citizens’ well-being will all suffer. The United States will thus further the end of its global leadership and the unfettered rise of China. Biden has the right instincts. Yet in order to sustain its technological dominance, the country will have to fundamentally reenvision the why and how of innovation. Biden will no doubt be consumed with addressing domestic challenges, but he has spent much of his career promoting the United States’ global leadership. By revamping American technological innovation, he could do both.

#### Failure to stop China allows them to establish a global dystopian surveillance state. Only Western democracies have self-correcting protections to safeguard citizens from over-stretch.

Charlie Campbell 19. East Asia Correspondent for TIME. "The Entire System Is Designed to Suppress Us': What the Chinese Surveillance State Means for the Rest of the World." https://time.com/5735411/china-surveillance-privacy-issues/.

Still, the risks are considerable. As Western democracies enact safeguards to protect citizens from the rampant harvesting of data by government and corporations, China is exporting its AI-powered surveillance technology to authoritarian governments around the world. Chinese firms are providing high-tech surveillance tools to at least 18 nations from Venezuela to Zimbabwe, according to a 2018 report by Freedom House. China is a battleground where the modern surveillance state has reached a nadir, prompting censure from governments and institutions around the globe, but it is also where rebellion against its overreach is being most ferociously fought.

“Today’s economic business models all encourage people to share data,” says Lokman Tsui, a privacy expert at the Chinese University of Hong Kong. In China, he adds, we are seeing “what happens when the state goes after that data to exploit and weaponize it.”

Some 1,500 miles northwest of where Mrs. Chen recovered her purse, surveillance in China’s restive region of Xinjiang has helped put an estimated 1 million people into “re-education centers” akin to concentration camps, according to the U.N. Many were arrested, tried and convicted by computer algorithm based on data harvested by the cameras that stud every 20 steps in some parts.

In the name of fighting terrorism, members of predominantly Muslim ethnic groups—mostly Uighurs but also Kazakhs, Uzbeks and Kyrgyz—are forced to surrender biometric data like photos, fingerprints, DNA, blood and voice samples. Police are armed with a smartphone app that then automatically flags certain behaviors, according to reverse engineering by the advocacy group Human Rights Watch. Those who grow a beard, leave their house via a back door or visit the mosque often are red-flagged by the system and interrogated.

Sarsenbek Akaruli, 45, a veterinarian and trader from the Xinjiang city of Ili, was arrested on Nov. 2, 2017, and remains in a detention camp after police found the banned messaging app WhatsApp on his cell phone, according to his wife Gulnur Kosdaulet. A citizen of neighboring Kazakhstan, she has traveled to Xinjiang four times to search for him but found even friends in the ruling Chinese Communist Party (CCP) reluctant to help. “Nobody wanted to risk being recorded on security cameras talking to me in case they ended up in the camps themselves,” she tells TIME.

Surveillance governs all aspects of camp life. Bakitali Nur, 47, a fruit and vegetable exporter in the Xinjiang town of Khorgos, was arrested after authorities became suspicious of his frequent business trips abroad. The father of three says he spent a year in a single room with seven other inmates, all clad in blue jumpsuits, forced to sit still on plastic stools for 17 hours straight as four HikVision cameras recorded every move. “Anyone caught talking or moving was forced into stress positions for hours at a time,” he says.

Bakitali was released only after he developed a chronic illness. But his surveillance hell continued over five months of virtual house arrest, which is common for former detainees. He was forbidden from traveling outside his village without permission, and a CCTV camera was installed opposite his home. Every time he approached the front door, a policeman would call to ask where he was going. He had to report to the local government office every day to undergo “political education” and write a self-criticism detailing his previous day’s activities. Unable to travel for work, former detainees like Bakitali are often obliged to toil at government factories for wages as miserly as 35¢ per day, according to former workers interviewed by TIME. “The entire system is designed to suppress us,” Bakitali says in Almaty, Kazakhstan, where he escaped in May.

The result is dystopian. When every aspect of life is under constant scrutiny, it’s not just “bad” behavior that must be avoided. Muslims in Xinjiang are under constant pressure to act in a manner that the CCP would approve. While posting controversial material online is clearly reckless, not using social media at all could also be considered suspicious, so Muslims share glowing news about the country and party as a means of defense. Homes and businesses now feel obliged to display a photograph of China’s President Xi Jinping in a manner redolent of North Koreans’ public displays for founder Kim Il Sung. Asked why he had a picture of Xi in his taxi, one Uighur driver replied nervously, “It’s the law.”

Besides the surveillance cameras, people are required to register their ID numbers for activities as mundane as renting a karaoke booth. Muslims are forced from buses to have their IDs checked while ethnic Han Chinese passengers wait in their seats. At intersections, drivers are ushered from their vehicles by armed police and through Tera-Snap “revolving body detector” equipment. In the southern Xinjiang oasis town of Hotan, a facial–recognition booth is even installed at the local produce market. When a system struggled to compute the face of this Western TIME reporter, the impatient Han women queuing behind berated the operator, “Hurry up, he’s not a Uighur, let him through.”

China strenuously denies human-rights abuses in Xinjiang, justifying its surveillance leviathan as battling the “three evils” of “separatism, terrorism and extremism.” But the situation has been described as a “horrific campaign of repression” by the U.S. and condemned by the U.N. Washington has also started sanctioning companies like HikVision whose facial–recognition technology is ubiquitous across the Alaska-size region. But Western aversion to surveillance is much broader and stems in no small part from abuses like the Facebook/Cambridge Analytica scandal, in which the “scraped” personal information of up to 87 million people was acquired by the political consultancy to swing elections around the world.

China is also rolling out Big Data and surveillance to inculcate “positive” behavior in its citizens via a Social Credit system. In China’s eastern coastal city of Rongcheng, home to 670,000 people, every person is automatically given 1,000 points. Fighting with neighbors will cost you 5 points; fail to clean up after your dog and you lose 10. Donating blood gains 5. Fall below a certain threshold and it’s impossible to get a loan or book high-speed train tickets. Some Chinese see the benefit. High school teacher Zhu Junfang, 42, enjoys perks such as discounted heating bills and improved health care after a series of good works. “Because of the Social Credit system, vehicles politely let pedestrians cross the street, and during a recent blizzard people volunteered to clear the snow to earn extra points,” she says.

Such intrusive government is anathema to most in the West, where aversion to surveillance is much broader and more visceral. Whether it’s our Internet browser history, selfies uploaded to social media, data scavenged from fitness trackers or smart-home devices possibly recording the most intimate bedroom conversations, we are all living in what’s been dubbed a “surveillance economy.” In her book The Age of Surveillance Capitalism, Shoshana Zuboff describes this as “human experience [broken down into data] as free raw material for commercial practices of extraction, prediction, and sales.”

When it comes to facial recognition, resistance is intense given the huge potential for indiscriminate data harvesting. The E.U. is reviewing regulations to give its citizens explicit rights over use of their facial-recognition data. While tech giants Microsoft and Amazon have already deployed the technology, they are also calling for clear legal parameters to govern its use. Other than privacy, there are equality issues too. According to a study by MIT Media Lab, facial-recognition software correctly identified white men 99% to 100% of the time, but that dipped as low as 65% for women of color. Civil-liberties groups are especially uneasy since facial recognition, despite its widespread use by American police, is rarely cited as evidence in subsequent court filings. In May, San Francisco became the first major U.S. city to block police from using facial–recognition software.

Even in China, where civil liberties have long been sacrificed for what the CCP deems the greater good, privacy concerns are bubbling up. On Oct. 28, a professor in eastern China sued Hangzhou Safari Park for “violating consumer privacy law by compulsorily collecting visitors’ individual characteristics,” after the park announced its intention to adopt facial–recognition entry gates. In Chongqing, a move to install surveillance cameras in 15,000 licensed taxicabs has met a backlash from drivers. “Now I can’t cuddle my girlfriend off duty or curse my bosses,” one driver grumbles to TIME.

Russia’s election meddling around the world highlights the risks of commercially harvested data being repurposed for nefarious goals. It’s a message taken to heart in Hong Kong, where millions have protested over the past five months to push for more democracy. These demonstrators have found themselves in the crosshairs after being identified via CCTV cameras or social media. Employees for state airline Cathay Pacific have been fired and others investigated based on evidence reportedly gleaned via online posts and private messaging apps.

This has led demonstrators to adopt intricate tactics to evade Big Brother’s all-seeing eye. Clad in helmets, face masks and reflective goggles, they prepare for confrontations with the police with military precision. A vanguard clutch umbrellas aloft to shield their activities from prying eyes, before a second wave advances to attack overhead cameras with tape, spray paint and buzz saws. From behind, a covering fire of laser pointers attempts to disrupt the recordings of security officers’ body-mounted cameras.

Fending off the cameras is just one response. When Matthew, 22, who used only his first name for his own safety, heads to the front lines, he always leaves his regular cell phone at home and takes a burner. Aside from swapping SIM cards, he rarely reuses handsets multiple times since each has a unique International Mobile Equipment Identity digital serial number that he says police can trace. He also switches among different VPNs—software to mask a user’s location—and pays for protest–related purchases with cash or untraceable top-up credit cards. Voice calls are made only as a last resort, he says. “Once I had no choice but to make a call, but I threw away my SIM immediately afterward.”

The Hong Kong government denies its smart cameras and lampposts use facial-recognition technology. But “it really comes down to whether you trust institutions,” says privacy expert Tsui. For Matthew, the risks are real and stark: “We are fighting to stop Hong Kong becoming another Xinjiang.”

Ultimately, even protesters’ forensic safeguards may not be enough as technology advances. In his Beijing headquarters, Huang Yongzhen, CEO of AI firm Watrix, shows off his latest gait-recognition software, which can identify people from 50 meters away by analyzing thousands of metrics about their walk—even with faces covered or backs to the camera. It’s already been rolled out by security services across China, he says, though he’s ambivalent about privacy concerns. “From our perspective, we just provide the technology,” he says. “As for how it’s used, like all high tech, it may be a double-edged sword.”

Little wonder a backlash against AI-powered surveillance is gathering pace. In the U.S., legislation was introduced in Congress in July that would prohibit the use of facial recognition in public housing. Japanese scientists have produced special glasses designed to fool the technology. Public campaigns have railed against commercial uses—from Ticket-master using facial recognition for concert tickets to JetBlue for boarding passes. In May, Democratic Congresswoman Alexandria Ocasio–Cortez linked the technology to “a global rise in authoritarianism and fascism.”

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#### Public policy economics is progressive---empirical basis creates incentives to address inequalities.

Harold Meyerson 21. Editor at large of The American Prospect. "The Berkeley School". American Prospect. 3-25-2021. https://prospect.org/economy/berkeley-school-economics/

Today, however, practical men—and women—ain’t what they used to be. Jerome Powell, the Trump-appointed chair of the Federal Reserve, says he’s more concerned about unemployment than he is about inflation—by the historic standards of the Fed, an act of high heresy. Congress just passed President Biden’s economic-rescue package, which does more for poor Americans than any program since it enacted Medicaid 56 years ago. Congress may yet enact a $15 minimum wage, while its most progressive members advocate a tax on wealth.

The powers that be are not getting these ideas from dead economists, or from the mainstream American economists who have dominated the field between the 1970s and the past few years (though they remain a considerable force). They are getting these ideas from a group of labor and public-policy economists who’ve surged to the forefront of the profession over the past decade. And more than anyplace else, these economists are clustered at the University of California, Berkeley.

Much of the work that shaped the groundbreaking child benefits in the $1.9 trillion stimulus bill, and directed those benefits for the first time to the genuinely poor, was done by Hilary Hoynes, a professor in both Berkeley’s economics department and its public-policy school. As Hoynes has documented in a series of studies, both the welfare reform of the 1990s and the reliance on tax credits to provide the child benefits largely, and perversely, excluded children in poverty. The benefits in the new stimulus bill are specifically targeted to include poor kids.

As for scholarly work that made the case for the $15 minimum wage, the multiple studies produced over the past quarter-century by Michael Reich—like Hoynes, a Berkeley professor of both economics and public policy—have documented that the presumed downsides of mandating such a raise are largely fictitious. The senators who tried to persuade the Senate parliamentarian that the raise would have a positive effect on the federal budget over the next decade relied on Reich’s fiscal estimates that it would net an additional $65 billion to federal revenues.

And the wealth tax? When Elizabeth Warren and Bernie Sanders began advocating for it while on the presidential campaign trail in 2019, they based their advocacy on the research of two other Berkeley economists, Emmanuel Saez and Gabriel Zucman, whose studies had concluded that the wealthiest 0.1 percent of Americans held 19.3 percent of the nation’s wealth—three times what that group had held in 1979. Saez and Zucman also reported that the total tax rate for billionaires in 2018 was 23 percent; while for all taxpayers, it was 28 percent. Warren’s proposal, updated this February, called for a 2 percent tax on families with wealth exceeding $50 million, with an additional 1 percent surcharge on wealth exceeding $1 billion—which the Berkeley duo estimated would raise roughly $3 trillion over ten years.

What, we may wonder, has been going on at Berkeley?

In brief, a historic change. Over the past two decades, Berkeley’s economics department and associated institutes have been at the forefront of two critical changes in the practice of economics: a heightened emphasis on empirical research, and an increasing focus on inequality.

#### Empirical rigor and public policy focus drive correction.

Harold Meyerson 21. Editor at large of The American Prospect. "The Berkeley School". American Prospect. 3-25-2021. https://prospect.org/economy/berkeley-school-economics/

BERKELEY HASN’T GONE it alone over the past three decades. Two Washington-based think tanks—the Economic Policy Institute and the Center for Economic Policy Research—have played key roles in studying our increasingly dysfunctional economy and developing policies to create more broadly shared prosperity. EPI, which was founded in 1986, has chiefly served as a tribune for the interests of American workers. In its long-running annual reports on The State of Working America and in a host of other papers, it has created some memorable explanations of the rise in inequality, including its graph charting the increases in productivity and income since the end of World War II (which rose in tandem until the 1970s, after which productivity continued to increase while median wages flatlined) and its yearly reports on the ratio of CEO pay to median worker pay. For its part, CEPR has highlighted a range of concerns, not least the several years of pre-2008-crash warnings from economist Dean Baker that the housing market had become a bubble that would soon and calamitously pop.

Berkeley builds on one other valuable and unsung tradition. Beyond the rarified debates of freshwater versus saltwater economics in elite universities, a few heroic radical economics departments kept alive the tradition of historical inquiry and critique of market folly. At the University of Massachusetts at Amherst, the New School in New York, and the University of California at Riverside, neo-Marxists and institutionalists created centers of scholarly dissent. Other schools, such as the Levy Institute at Bard College, were hospitable to the radicalism of Keynes, as opposed to watered down neo-Keynesianism. These critics proved prescient about the failure of markets and influenced the new mainstream at Berkeley and beyond. Heather Boushey, now on President Biden’s Council of Economic Advisers, has her Ph.D. from the New School.

Within the circuit of Berkeley, Harvard, MIT, and Princeton, there are frequent migrations of professors and newly minted Ph.D.s. “I have eight former Ph.D. students now on the Berkeley faculty,” says Harvard’s Katz. Sometimes, the migrations flow west to east, as in the case of Harvard’s Raj Chetty, one of the discipline’s leading empirical economists on such topics as intergenerational mobility (or the lack thereof), who began such work at Berkeley and is now continuing it in Cambridge.

That said, Berkeley sounds increasingly confident about its hard-won place in the economics ecosystem. “If you want to do labor economics, or public [policy] economics, you can make the case that Berkeley is the place to come,” says Rothstein. Ellora Derenoncourt, who was hired last year as an assistant professor both in the economics department and the Goldman School, says she came because Berkeley offered “a space to combine inequality studies with policy solutions.” Since she’s been on staff, she’s talked to a number of students who’d been admitted to several graduate economics programs at top-ranked schools and were deciding which to attend. For many, she says, “it’s the inequality issue that pushes them to come to Berkeley.”

Increasingly, that issue isn’t seen as one simply of income, education, and class. “Economics has not been the discipline at the forefront of understanding racism,” Derenoncourt notes, and, indeed, economics departments have long been the whitest and most male of any of the social sciences. Not surprisingly, a growing number of professors and graduate students are now working on issues of racial and gender inequality, and the experience of immigrants as well.

Nina Roussille is one of those students; she just completed her doctoral studies after five years at Berkeley and as an IRLE associate. Her dissertation used the database provided by Hired.com to research gender differences in salary, where she found that mid-career women generally ask for lower salaries than their male counterparts seeking the same jobs, as their networks tend to include more experienced women workers who’ve been accustomed to lower salaries than their male co-workers.

At Berkeley, she says, the emphasis in choosing your dissertation topic is often on whether the topic could address a question in a way that could change the way people work, or the policies that shape their work. “It’s certainly not the case in departments across the nation,” she says, “but at Berkeley, everyone is trying to be on that frontier.”

And that frontier may just be spreading. “Berkeley, Harvard, MIT, and Princeton are the leaders, but there’s a broad shift toward a more empirical focus,” says Harvard’s Katz. “You see it in young European economists. Even the young people at Chicago are using these methods.”

Indeed, a paper issued this February confirms Katz’s assessment. Using “anonymized bank account data covering millions of households,” the paper examined whether the federally funded increase in unemployment insurance benefits during the pandemic actually discouraged the recipients of the more-generous-than-usual UI from seeking work, as the standard economic models predicted (and as West Virginia Sen. Joe Manchin said he suspected). Instead, the authors wrote, while “simple job search models predict a sharp decline in search in the wake of a substantial benefit expansion … we instead find that the job-finding rate is quite stable.”

In not discouraging job hunting and in boosting economic activity generally, they concluded, “benefit expansions during the pandemic were a more effective policy than predicted by standard structural models.”

And the authors of this bit of empirically derived heresy? Three economists from the JPMorgan Chase Institute and three from the University of Chicago. And, the unkindest cut of all, the paper was published by Chicago’s Becker Friedman Institute, named after the university’s celebrated laissez-faire apostles Gary Becker and Milton Friedman.

The age of Berkeley economics may just be getting started.

#### mapping---positing an outline of antitrust policy and its negative externalities while constructing a solution is epistemologically valuable---it breaks down dogmatism and cognitive biases.

Joshua Polchar 20, Strategic foresight analyst at the OECD and former policy analyst at The Hague Centre for Strategic Studies. M.A., Political Science, University of Amsterdam. B.A., International Studies, University of Warwick, “Unboxing the Future: Finding the Futures Hidden in Plain Sight,” Institute for Security Studies, pg. 1-7, August 2020, JSTOR.

To make policy is to think about the future – usually trying to shape it for the better. In policy, as much as any part of our lives, our thinking is strongly influenced by our perception of time, yet paradoxically this perception of time is usually unconscious and unquestioned.1 Policy experts and decision-makers are futures thinkers whether they realise it or not. Yet like all humans, they tend to rely largely on a set of familiar modes of thinking when it comes to preparing for the future – modes of thinking that are instinctive, intuitive or institutionalised.

No one way of thinking about the future is necessarily better than another, but all of them are limited, and leave some things unchallenged or implicit. As a result, sticking to only one approach means missing potentially valuable insights that could be gained by using other perspectives. Of course there is no guarantee that learning these lessons will result in perfect preparedness for what lies ahead, but if there is great potential in ‘out-of-the-box thinking’, then it helps to better understand and challenge what is boxing our thinking in.

This Brief, and the strategic foresight approaches it outlines, are therefore not intended to introduce thinking about the future where it was absent, but rather to challenge, discipline, and guide the futures thinking already taking place. It will take the reader through five of the ways in which relying only on conventional ways of thinking about the future may be keeping them from seeing a lot more. It will seek to answer the question: how can the discipline of strategic foresight make a positive contribution to the field of foreign policy?

This Brief is not an instruction manual or how-to guide on methodologies of strategic foresight. Less still is it able to help the reader to better predict the future, or make the right call on what to prepare for. Instead it intends to show how thinking differently about the future can help to increase our awareness and knowledge in the present and what it means in terms of the decisions we make.

PROBABLE OR USEFUL? THE ‘RIGHT’ FUTURE(S) TO LEARN FROM

Forecasting based on past evidence can be very useful. Forecasts allow us to better understand trends by analysing the factors underlying them, and envisaging trajectories that they could follow. However forecasting also has limitations. Many high-quality forecasts have turned out to contain errors. Forecasts may use probability or multiple projections to estimate the range of likelihood of an outcome, but this is often misinterpreted, and people may assume the middle of a range of outcomes is the ‘real future’, or discount improbable outcomes as not worth considering.2 Furthermore some future developments simply cannot be forecast because too little is known about the relevant factors.3

While evidence is vital for conclusions about what happened in the past, there can never be complete evidence about the future. Innumerable things will come about in the future which will be truly unprecedented and for which there is little or no hard proof today. The future is emergent and at best only indirectly observable through what is occurring in the present. Ignoring developments with only weak evidence means missing developments from which we could have learned in advance. One such case is the effect of disruptive technology on the defence and security domain. It is not sufficient to refer to previous technological advances to understand, for example, how artificial intelligence may enable transformations not just in accomplishing today’s tasks within today’s frameworks, but in the way defence forces are organised and operate.4

Indications about the future can also be contrasting or even conflicting. In these cases it is common for people without a background in strategic foresight to suggest that the ‘real future’ will ‘probably be a combination’ of diverging alternative outcomes under consideration. This may be true but the statement defeats the purpose of considering alternatives in the first place. ‘We consider the future to be fictional and useful rather than factual and truthful; so it is these fictions that need to be modelled, not “reality.”’5 There is little to be gained from correctly predicting the future if doing so does not enable us to take wiser actions today – and taking wiser actions today does not depend on correctly predicting the future. Taking wiser actions today instead depends on how much we challenge our ideas of the future.

Using the past as a guide is an understandable way to try to prepare for the future. Given that the future is inherently and always uncharted territory, it is intuitive that humans would want to refer to something familiar. In foreign policy in particular, theories and mental models of international relations help to explain the system — and are often used (implicitly or explicitly) to support policy decisions. Theories of international relations may be very appealing for their coherence and explanatory power, however understanding the past does not mean understanding the future. Indeed, scholars of international relations may even use the word ‘prediction’ with reference to their theories’ ability to correctly infer past phenomena, rather than provide forecasts for policymakers to respond to. 6 One proposed response is to make even more future predictions to test the validity of theories and critically evaluate assumptions.7 However if predictions are mainly useful for testing our mental models of the past, rather than preparing for disruptions in the future, then making predictions does not help us take better actions in the present; it only lets us prepare to use hindsight at a later date and possibly learn from the past.

We do not need to wait for the future to pass us by and leave us with hindsight; policymaking should adopt an approach that enables it to take action in the present: foresight. This means letting go of seeking a single most probable future, and turning attention to multiple surprising and significant futures that test our mental models ahead of time. Strategic foresight does not seek to determine which future outcomes will come true. But it also does not base its analysis on fanciful conjecture. Instead the task is to assess which plausible future outcomes can be used and learned from.8 To do that, we need to consider what ideas we are not already attending to (the surprising ones), and what ideas would matter most to our organisation's way of working (the significant ones). The standard by which an idea about the future should be judged is therefore not probability but rather the degree of surprise and significance.

This conception of the future in terms of multiple alternatives was born out of necessity in foreign policy before moving into other fields. Recognising the fundamentally different and unpredictable nature of international relations after 1945, analysts at RAND Corporation used the uncertainty to create multiple alternative contexts – scenarios – in which to test strategies and see how they might fare. This use of multiple futures to provide ‘ersatz experience’9 allowed strategists to go beyond merely attempting to predict and respond to a single future, and to better understand the potential success of their actions in varying conditions.

EVENTS OR CONTEXT? DRAMATIC EVENTS AND THE WORLDS THEY INHABIT

Consider any of the most pivotal events in history (the World Wars, the fall of the Berlin Wall, the coronavirus pandemic, any revolution, war or invention): none of them can be explained without an understanding of the context – the zeitgeist, the paradigms – that prevailed at the time. Take any of the most impactful eras of history (the Cold War, the Golden Age, the Enlightenment): none of them can be explained without an understanding of the events that initiated, sustained or ended them. In any good explanation of the past, analysis always combines elements of action (sequential one-off occurrences) with elements of context (ongoing states of being that paint a picture). The interplay between events and context is complex and we cannot hope to get an understanding of what happened without considering both together.

“History is not just one thing after another”,10 and nor is the future: it is a combination of events and context. Yet in spite of this logic, discussions about the future usually concern only new events, not new contexts. Compared with context, it is perhaps easier to imagine and describe a future event, assess its probability, and later test its correctness.11 But it is vital that we understand that context in the future can and will be different to that of today. There is much more to be learned by thinking about the conditions in which we might be operating for extended periods of the future than there is to be learned from events which come and go.

Likewise, it is clear that certain technologies have indeed catalysed transformations in human civilisation – the printing press, the postage stamp, and the internet being some of the clearest examples. However it was not possible to predict the emergence of these technologies, the form they would take, or how exactly they would transform their societies. None of these important technologies would have achieved widespread use without a society that had a use for them. None of the important developments that followed were inherent in the technologies themselves or in their originally intended applications. They all arose from the ways in which societies made use of the technologies in later years.

Studying an event or new technology which might materialise is a potentially useful yet highly specific field of knowledge to explore and use to develop ideas about the future. Taken in isolation, it only reveals the immediate implications of the event or technology for our own organisation and times, potentially missing the broader social, economic, environmental or political changes in circumstances that might precede or follow the emergence of that event or technology. Without that additional analysis and interpretation (often referred to as ‘sense-making’), studying an event or technology on its own does not support us to imagine ourselves in a very different future – or develop strategies to succeed in it.

One example of the effective use of context rather than events is in the future scenarios project developed by the Dutch ministry of defence, whose scenarios are built in the tradition of NATO’s Multiple Futures and the US National Intelligence Council’s Global Trends projects, as well as work of the German Zentrum für Transformation der Bundeswehr.12 The scenarios focus on which actors matter most, and how they relate to one another – contextual factors which could determine the emergence, significance, and consequences of events. These scenarios, and subsequent foresight processes, have been used in the Dutch government among others to inform policy considerations in terms of what is important to focus attention on in the present, and what capabilities to develop ahead of time. 13

COMPLICATED OR COMPLEX? ALL OTHER THINGS ARE NEVER EQUAL

In the 2020 coronavirus pandemic, there were multiple sets of uncertainties. There were uncertainties surrounding the behaviour of the virus itself (its ability to cause disease in different people, the various routes of transmission, etc.); uncertainties surrounding how the pandemic would unfold (death rate, reproduction rate, etc.); and uncertainties about what would happen next (how many businesses would bounce back from lockdown losses, how countries’ geopolitical relations would be affected, etc.). On all of these matters, governments sought the best available knowledge and advice.

Yet relatively little attention was given to what ties all the above uncertainties together: the underlying characteristics of societies, different all around the world, which determined the behaviour of the virus, the unfolding of the pandemic, and what would happen next. This broader set of factors concerned matters such as the level of physical contact customary in a given culture, the use of mass transit compared with private vehicles, perceptions of risk, and frequency of intergenerational contact. These uncertainties had to be assumed in advance in any epidemiological model used to inform policy decisions on controlling the pandemic. The tendency to make these assumptions implicitly rather than explicitly may explain why some models proved misleading, and why models designed for use in certain places proved useless in others.

The future is strongly shaped by multiple arrays of factors like those above. Yet too often we treat such complexity as if it was merely complicated. The difference is great. Complicated systems like a phone or a car maybe be difficult to understand but there are fixed rules governing interactions. These rules can be learned through empirical observation and expert analysis to reliably predict how the system will behave and the likely effects of any changes made. Complex systems like a phone conversation or a traffic jam contain multiple interrelated causal relationships, uncertainties, feedback loops, tipping points, emergence, and other effects which make them more than the sum of their parts. There is no reliable set of rules which will always apply, and making changes will not always produce the same effect.

In studying complex policy domains like international relations or an economy we tend to try to separate relationships out and infer rules that govern them, all other things being equal. This principle of ceteris paribus can be beneficial and serves a purpose in understanding the aetiology of phenomena and the relationships between them, but its usefulness is limited to complicated problems which can be empirically observed. Those conditions do not apply in the case of the future, since the future is complex and impossible to empirically observe.14

Humans find it challenging to grasp the future as a tangle of interrelated phenomena which cannot easily be separated. One way of making this complexity manageable is not to reduce the number of variables, but instead to weave them together into narratives. Stories are just as valid as models as a guide to the future, if they help us to understand something enough to take effective action.15 One high-profile example of foresight analysis in the security field which views the future in this way is the National Intelligence Council’s Global Trends report, in which scenarios are used to explore how “[future] events unfold in complex ways for which our brains are not naturally wired.”16 Most readers would be struck by the prescience of the storyline in one of the scenarios about a global pandemic in 2023 which ‘dramatically reduced global travel in an effort to contain the spread of the disease, contributing to the slowing of global trade and decreased productivity’. However from a foresight perspective, what is most valuable is not the success of the analysis in spotting a particular development that came to pass, but the complexity and interconnectedness of multiple phenomena. The use of narrative allows these to be perceived, made sense of, and woven into storylines which can be used to challenge and improve strategy in the present – irrespective of whether any of the predictions actually come to pass.17

SHOULD OR MIGHT? SOLVING THE FUTURE BEFORE EXPLORING IT

Economic growth, rules-based trade, free markets, European integration, containment: these have all been presented as the objective of at least one institution or school of thought. To supporters of these institutions or schools, discussions of the future and strategy will usually turn quite quickly to how such objectives can be furthered. But in reality, they are more than objectives: they are solutions pursued in response to challenges such as poverty, war and geopolitical competition. In a world of complex problems, proven approaches cannot be relied on to work every time; what worked last time might not work the next. The risk is that organisations find themselves in new contexts where their trusted models and approaches to deal with challenges and grasp opportunities stop performing as they used to. Yet in many futures dialogues, participants will advocate addressing an imagined future challenge or opportunity with more of the same approach their organisation is already advocating.

Policy is in many respects a problem-solving discipline. By trying to remedy failure or optimise success, we are seeking to find a solution. As a result, when discussing the future, policy experts tend to switch gear immediately upon identifying a phenomenon, moving from observing it to attempting to solve it. However this mode of thinking can divert attention away from another: exploration. Problems may not be how they appear, and by switching to problem-solving mode, we leave observing mode behind and risk missing out on many complex and interconnected factors that may also be of great relevance. This mode of thinking is analogous to proceeding forward down what seems like the best road to a destination without first charting the territory and exploring different routes that may offer a smoother or more efficient journey.

A similar difficulty applies when considering which problems we seek to solve. Most problems in policy are addressable but not solvable. They can be characterised as ‘wicked problems’ because they have innumerable causes, are tough to describe, and do not have a right answer; attempting to tackle wicked problems using conventional strategies, as if they were merely difficult problems, not only risks failure but could even make the situation worse.18 The security field is beset with wicked problems, concerning virtually every major issue – terrorism, cyber threats, natural disasters, and inter- and intra-state conflict to name but a few.

It is also important to recognise that while we believe in the power of policy to change the future, it is not omnipotent. Like any organisation, policy institutions must discipline their conversations to make the distinction between external developments beyond their control and the limited ability of their own actions to shape them. “Perhaps the most important insight of complexity is that policymakers should stop pretending that an economy can be controlled.”19 Problem-solving is not inherently bad, but it should not be allowed to crowd out problem-exploring. During policy dialogue, it is important to give adequate time to observing a situation without judgement, understanding the relevant factors and their linkages, and speculating on the multiple different ways in which the future could develop. Strategic foresight methods such as scenario planning and megatrends analysis are ways to create an artificial future world which can be explored, and subsequently different solutions tried out and rehearsed ahead of time. Doing so will not necessarily lead to the ‘right solutions’, but by considering a fuller picture of problems, we can hope that our solutions will take more relevant factors into account and hence be better informed.

OFFICIAL EXPECTATIONS OR ANTICIPATIONS? UNUSUAL BUSINESS AS USUAL

The coronavirus pandemic was not unforeseen. All of the factors which led to the emergence and spread of the novel virus were known and studied well in advance;20 high-profile and respected experts warned of humanity’s lack of preparedness for an outbreak; and numerous countries had national risk registries and assessments which accounted for the possibility of such a situation developing. Yet in declaring the disease a pandemic, the World Health Organisation (WHO) warned of ‘alarming levels of inaction’ in spite of clear knowledge and advice on what countries needed to do.21 Likewise, it is widely accepted that mitigating the climate crisis and dealing with its consequences will require radical changes in policy and strategy, well beyond the actions of most major organisations and governments today.22 Both coronavirus and the climate crisis are cases of emerging futures from which a great deal can be learned today. A failure to grasp emerging futures proved fatal to makers of traditional mobile phones and film cameras who failed to adapt to their disrupted contexts. So why do organisations not change course, even in the face of strong indications that their current actions are inadequate?

A sense of future is always implicit in our actions, even when we do not realise it. In the absence of conscious foresight, that sense of future is usually ‘business as usual’ — assumptions and expectations that we can continue in the same way as at present and still succeed or at least cope. Such untested assumptions and expectations may be so deeply embedded in an organisation’s actions that its decision-makers are not even aware that they exist until it is too late.

There are also multiple social and institutional factors that protect the incumbency of business as usual. Unorthodox thinkers who tell an organisation that it needs to radically rethink its understanding of a complex issue or admit that it was doing the wrong thing all along rarely make themselves popular. Some may experience groupthink and moderate their views; some may face censorship; others may censor themselves. Sometimes the preservation of business as usual is in the interests of a powerful individual or group. As a result, foresight work is often used to justify the dominant strategy rather than to challenge it. But that does not make controversial ideas about the future any less useful.

The word ‘expectation’ has two meanings in English: the first refers to beliefs about what will happen (anticipation); the second refers to requirements to fulfil an obligation. In this sense, the expected future is an anticipatory phenomenon but also an institutional phenomenon, something that two writers on the subject refer to as the ‘official future’.23 When our organisations expect us to expect something, they are furnishing an otherwise open future with ideas of today – a process which has even been described as ‘colonising the future’.24 By expecting people to expect an approved, official version of the future, organisations fail to make the most of their diverse knowledge, and potentially miss untold opportunities and face needless difficulties. The future does not care if disruptions come at great expense, confusion, or embarrassment to an organisation, but the staff of the organisation do. When it fails to materialise, the expected future is not only a failure of anticipation on an individual level,25 but a failure of cognition on a collective level.

To address these missed opportunities, organisations should make a virtue of the uncertain, undeveloped nature of the future to avoid groupthink and promote a diversity of ideas–including those which imply weaknesses in the organisation’s current way of thinking and strategising. This has been one of the main benefits of scenarios in defence planning in successive US administrations according to RAND Corporation. In a review of force planning scenarios over time, it found that “a portfolio of scenarios that includes a wider range of plausible but stressing scenarios is more likely to yield more useful information about risks, gaps, and mitigation measures than a smaller and less stressing set, and that testing the forces against more combinations of scenarios and scenario variations is better than testing it against only a few.”26

CONCLUSION

People often perceive the future as being in another place at another time. This notion that thinking about the future involves ‘looking ahead’ (and taking our eyes off the present) leads to the misconception that the current situation is so uncertain or urgent that there is no time to think about the future. This is really a false dilemma. The future needs to be demystified: it is not a remote entity that is separate from the present, just waiting to be found. In fact it does not really exist anywhere other than in the present. The only futures we can really anticipate and learn from are the ones we imagine right now!

What does this mean concretely in policymaking? It is not enough simply to use foresight as an alternative ‘method’ to identify the ‘right things’ to think about in the future and then factor them into the traditional policymaking process. ‘Strategic foresight doesn’t help us figure out what to think about the future. It helps us figure out how to think about it.’27 Strategic foresight is a way of thinking and working – not just a one-off process or event, but a long-term shift in mindset.

Strategic foresight does not view the future as a single, objective, knowable entity; therefore it cannot be passively studied as if it were. Multiple ideas about the future require dialogue for a learning process with useful implications for action. The considerations presented in this Brief offer a starting point for readers to pause and take time to use the future today. Strategic foresight practitioners can help organisations take this further by helping to embed the practice in their decision-making.

By recognising that the future is already being formed all around us, we can ‘unbox’ it and understand it better now. This helps us pay attention to surprising and significant developments which seem improbable but from which we can learn, allowing us to broaden our focus from events to context. We can see the complex interconnectedness of drivers of future change. We can pause our problem-solving and go into exploration mode. We can ask ourselves the uncomfortable and unpopular questions. Most of all, we can use the fact that the future is already present to start creating a better future in the present.