# 1NC

### 1

#### Despite growing rivalry, US-China economic interdependence strong now. Exchange of tech know-how, collaboration science research, and massive US-China STEM pipeline improving relations – but it can easily collapse.

Hass 8/12 [Ryan Hass (Senior Fellow - Foreign Policy, Center for East Asia Policy Studies, John L. Thornton China Center The Michael H. Armacost Chair Chen-Fu and Cecilia Yen Koo Chair in Taiwan Studies Nonresident Fellow, Paul Tsai China Center, Yale Law School), 8-12-2021, "The “new normal” in US-China relations: Hardening competition and deep interdependence," Brookings, <https://www.brookings.edu/blog/order-from-chaos/2021/08/12/the-new-normal-in-us-china-relations-hardening-competition-and-deep-interdependence/> // belle]

The intensification of U.S.-China competition has captured significant attention in recent years. American attitudes toward China have become more negative during this period, as anger has built over disruptions resulting from the COVID-19 pandemic, Beijing’s trampling of Hong Kong’s autonomy, human rights violations in Xinjiang, and job losses to China.

Amidst this focus on great power competition, two broader trends in the U.S.-China relationship have commanded relatively less attention. The first has been the widening gap in America’s and China’s overall national power relative to every other country in the world. The second has been the continuing thick interdependence between the United States and China, even amidst their growing rivalry. Even on economic issues, where rhetoric and actions around decoupling command the most attention, trade and investment data continue to point stubbornly in the direction of deep interdependence. These trends will impact how competition is conducted between the U.S. and China in the coming years.

SEPARATING FROM THE PACK

As America’s unipolarity in the international system has waned, there has been renewed focus on the role of major powers in the international system, including the European Union, Russia, India, and Japan. Each of these powers has a major population and substantial economic weight or military heft, but as my Brookings colleague Bruce Jones has observed, none have all. Only the United States and China possess all these attributes.

The U.S. and China are likely to continue amassing disproportionate weight in the international system going forward. Their growing role in the global economy is fueled largely by both countries’ technology sectors. These two countries have unique traits. These include world-class research expertise, deep capital pools, data abundance, and highly competitive innovation ecosystems. Both are benefitting disproportionately from a clustering effect around technology hubs. For example, of the roughly 4,500 artificial intelligence-involved companies in the world, about half operate in the U.S. and one-third operate in China. According to a widely cited study by PricewaterhouseCoopers, the U.S. and China are set to capture 70% of the $15.7 trillion windfall that AI is expected to add to the global economy by 2030.

The United States and China have been reinvesting their economic gains to varying degrees into research and development for new and emerging technologies that will continue to propel them forward. While it is not foregone that the U.S. and China will remain at the frontier of innovation indefinitely, it also is not clear which other countries might displace them or on what timeline. Overall, China’s economy likely will cool in the coming years relative to its blistering pace of growth in recent decades, but it is not likely to collapse.

DEEP INTERDEPENDENCE

At the same time, bilateral competition between the United States and China also is intensifying. Even so, rising bilateral friction has not – at least not yet – undone the deep interdependencies that have built up between the two powers over decades.

In the economic realm, trade and investment ties remain significant, even as both countries continue to take steps to limit vulnerabilities from the other. For example, Chinese regulators have been asserting greater control over when and where Chinese companies raise capital; Beijing’s recent probe of ride-hailing app Didi Chuxing provides but the latest example. China’s top leaders have been emphasizing the need for greater technology “self-sufficiency” and have been pouring billions of dollars of state capital into this drive. Meanwhile, U.S. officials have been seeking to limit American investments from going to Chinese companies linked to the military or surveillance sectors. The Security and Exchange Commission’s scrutiny of initial public offerings for Chinese companies and its focus on ensuring Chinese companies meet American accounting standards could result in some currently listed Chinese companies being removed from U.S. exchanges. Both countries have sought to disentangle supply chains around sensitive technologies with national security, and in the American case, human rights dimensions. U.S. officials have sought to raise awareness of the risks for American firms of doing business in Hong Kong and Xinjiang.

Even so, U.S.-China trade and investment ties remain robust. In 2020, China was America’s largest goods trading partner, third largest export market, and largest source of imports. Exports to China supported an estimated 1.2 million jobs in the United States in 2019. Most U.S. companies operating in China report being committed to the China market for the long term.

U.S. investment firms have been increasing their positions in China, following a global trend. BlackRock, J.P. Morgan Chase, Goldman Sachs, and Morgan Stanley have all increased their exposure in China, matching similar efforts by UBS, Nomura Holdings, Credit Suisse, and AXA. The Rhodium Group estimates that U.S. investors held $1.1 trillion in equities issued by Chinese companies, and that there was as much as $3.3 trillion in U.S.-China two-way equity and bond holdings at the end of 2020.

One leg of the U.S.-China economic relationship that has atrophied in recent years has been China’s flow of investment into the United States. This has largely been a product of tightened capital controls in China, growing Chinese government scrutiny of its companies’ offshore investments, and enhanced U.S. screening of Chinese investments for national security concerns.

Another area of U.S.-China interdependence has been knowledge production. As U.S.-China technology expert Matt Sheehan has observed, “With the rise of Chinese talent and capital, the exchange of technological know-how between the United States and China now takes place among private businesses and between individuals.” Leading technology companies in both countries have been building research centers in the other. Alibaba, Baidu, and Tencent have all opened research centers in the United States, just as Apple, Microsoft, Tesla, and other major American technology companies rely upon engineering talent in China.

In science collaboration, The Nature Index ranks the joint research between the two countries as the world’s most academically fertile. U.S.-China scientific collaboration grew by more than 10% each year on average between 2015 and 2019. Even following the global spread of COVID-19, American and Chinese experts collaborated more during the past year than over the previous five years combined. This has led to over 100 co-authored articles in leading scientific journals and frequent joint appearances in science-focused workshops and webinars.

China also is the largest source of international students in the United States. In the 2019-20 year, there were over 370,000 Chinese students in the U.S., representing 34% of international students in colleges and universities. Up until now, many of the top Chinese students have stayed in the United States following graduation and contributed to America’s scientific, technological, and economic development. It remains to be seen whether this trend will continue.

#### Plan hurts US-China relations – means China goes back on it’s promise to regulate IP violations and draws in U.S. crackdown.

Shape 2/19 [Steven M. Shape; registered patent attorney and electrical engineer who has represented preeminent technology companies in complex, high-stakes Intellectual Property litigation; 2-19-2021, "IP Law Looms Large Over U.S.-China Relations," No Publication, [https://www.mondaq.com/trademark/1038030/ip-law-looms-large-over-us-china-relations //](https://www.mondaq.com/trademark/1038030/ip-law-looms-large-over-us-china-relations%20//) belle]

The U.S. and China were indisputably the two largest parties in the global trade war that consumed much of the last several years. Particularly between early 2018 and late 2019, it seemed as if one could hardly go a week, if that, without hearing something about tariffs, exports, imports, steel, soybeans, then-President Donald Trump, President Xi Jinping and the like. Accusations regarding violations of Intellectual Property law were among the biggest flashpoints, and ultimately, China announced new regulations concerning IP protection in November 2019 as a conciliatory move. Nearly 14 months later, newly inaugurated President Joe Biden has yet to fully clarify his administration's stance toward China. However, it is inevitable that IP rights and their preservation will factor into negotiations between the two economic giants. A look back at the proposed reforms (and their effects) Reports from CNN at the time claimed that China's prospective IP law reforms focused on making the penalties for IP infringement more strict. It would also put the government's increasingly modernized tech infrastructure to use in the discovery and prosecution of such crimes. Beyond that, the proposal carried few specifics. Although it is unclear whether Beijing's gambit worked as the deciding factor for Washington, it certainly did not fail. The two nations agreed in principle on "Phase One" of a new trade agreement December 12, 2019, per The Washington Post, and formalized the deal about a month later. The U.S. pledged not to impose further tariffs and roll back existing import taxes in return for China's IP reforms and agreement to buy American goods. In the 14 months that followed, so much changed. COVID-19's devastating impact on human life and the global economy made it difficult to gauge the positive effects of the tariff relief or IP reform. A report by the South China Morning Post found that China did not meet its import goal for 2020, with some analysts concluding the Phase One target was unrealistic. On the IP front, a Hong Kong news provider noted that Beijing had drafted some specific guidance to protect pharmaceutical patents, trade secrets and copyrights, but it was unclear how well they were being implemented. Additionally, a January 2021 report by the U.S. Patent and Trademark Office (USPTO) found that Chinese policies which offered subsidies for certain trademark and patent applications helped motivate a glut of fraudulent and bad-faith filings in the last few years. The bigger picture of China's IP law A casual observer or someone just learning of this issue might assume that until recently, China had little or no IP laws on the books. Of course, that is not true. However, there are many factors at play complicating the matter of Chinese IP protection policies. As noted in Harvard Business Review, China is quite strict in certain aspects of IP protection: Beijing allows (and encourages) all businesses to impose non-compete agreements to help protect trade secrets and other IP assets. In addition, according to the National Law Review, two new measures were passed in 2020 specifically to combat bad-faith trademark applications, in addition to the other new guidelines being imposed by the China National Intellectual Property Administration (CNIPA) in accordance with the Phase One agreement. All that said, it would be inaccurate to describe Chinese IP law as thoroughly protective for either domestic or foreign innovators. Along with the aforementioned trademark and patent subsidies, considerable controversy stems from "forced technology transfer" policies. According to the University of Oxford's Business Law Blog, foreign companies looking to do business in China must turn over their technology to local firms or be denied the right to operate within China. This effectively means turning over the blueprints (literal or otherwise) to such technology - which is all but equivalent to surrendering the IP. It creates considerable opportunities for infringement, fraud and corruption. Also, in disputes with foreign firms, some local IP courts still markedly favor domestic organizations. Chinese government representatives often resent such accusations of bias or corruption. In their view, the deals represent friendly agreements between businesses, and courts' decisions are not politically motivated. While Oxford noted that FTT guidelines are not as pervasive now as they were a few years ago, they have yet to disappear altogether. The Biden approach: Not dissimilar, but multilateral If the new U.S. Secretary of the Treasury, Janet Yellen, is to be believed, the Biden administration will not tolerate any signs of lapses in China's IP protections. "We need to take on China's abusive, unfair and illegal practices," Yellen said to the Senate Finance Committee at her confirmation hearings. As reported by Bloomberg, she added, "[China has] been stealing intellectual property and engaging practices that give it an unfair technological advantage, including forced technology transfers. And these . are practices that we're prepared to use the full array of tools to address." Biden had expressed similar sentiments during a December interview with The New York Times. However, he also said that they would work with ally nations to "develop a coherent strategy" for addressing cases of IP infringement and other issues - a stance Yellen echoed before the Senate - instead of taking China on in a unilateral and bellicose manner. This more nuanced approach could yield greater cooperation from Beijing and help repair U.S.-China trade relations, but we will likely not know one way or the other for some time. As we saw with the trade war, conflicts between the U.S. and China can quickly escalate and have ripple effects throughout the world. It would thus be wise for all organizations doing business in China to keep themselves abreast of the country's evolving IP regulations and work with a reliable IP services provider to help establish strong protection for their intangible assets.

#### AI destabilizing but dialogues key to peaceful AI – anything else risks escalation to nuclear war.

Haotian ’21 [Qi Haotian (assistant professor in the School of International Studies at Peking University, where he teaches courses on international security, military science, international public policy, and game theory. He is also secretary general of the Institute for Global Cooperation and Understanding at Peking University. His research interests include technological transitions and world politics, international security and conflict management, and methodology and philosophy of social science) April 2021, " US AND CHINESE ARTIFICIAL INTELLIGENCE CAPABILITIES," United States Institute of Peace, <https://www.usip.org/sites/default/files/2021-04/pw_172-enhancing_us-china_strategic_stability_in_an_era_of_strategic_competition_us_and_chinese_perspectives.pdf> // belle]

The rapid decision-making features of AI can be yet another destabilizing factor. AI’s advantage in speed can be detrimental if it unnecessarily accelerates the escalation of conflicts from crisis to war, or even from conventional war to nuclear confrontation. Furthermore, improvements in ISR capabilities can narrow the window for diplomatic mediation and reduce the time available for crisis management. AI, however, can also have a stabilizing effect through the enhancement of crisis and battlefield simulations. AI-enabled war games now involve more complex multirole interactions with variables and parameters that can be adjusted to explore how dynamic interactions of various factors such as weapons and allies can influence the development of a complex strategic environment. This employment of evolutionary learning can help stabilize strategic relations and mutual deterrence by demonstrating to decision-makers the consequences of certain behaviors and actions. CONCRETE STEPS TO TAKE IN THE NEAR TERM As the United States and China pursue the incorporation of AI into their military forces, they have a shared interest in avoiding both intended and unintended escalations caused by AI-enabled systems. The two countries should establish systematic confidence-building measures and develop a shared understanding of what a future AI-enabled military transformation might entail as well as its strategic impacts. While it may be difficult for the United States and China to agree on certain questions—such as how to tailor defense tools for AI systems that span multiple military domains—the two sides can still work together to find common ground and jointly explore applications for AI to strengthen strategic stability. Although dialogue exists between industry experts, academics, and think tanks in both countries, more direct exchanges among diplomats, military leaders, AI researchers, and multidisciplinary scholars is crucial for fostering mutual understanding and opening avenues for cooperation. Such dialogue can occur in parallel with existing multilateral efforts, such as the Group of Governmental Experts on lethal autonomous weapon systems, held through the United Nations Convention on Certain Conventional Weapons. The two countries should hold dialogues examining how existing international law can constrain the use of AI for military purposes and the implications of private sector development of dual-use technology. They should also address the risks that the weaponization of technology poses to nuclear stability and develop practical measures for technological management. Moreover, the two sides should establish a systematic dialogue mechanism to exchange views on emerging concerns, such as fail-safe mechanisms and how to reduce the risk of crises and conflict escalation due to AI-driven cyberattacks, especially on strategic assets. In addition to the above near-term measures, there are also some long-term steps that, although not feasible at present, would be beneficial and should be taken when circumstances allow. For example, China and the United States should increase transparency and enhance mutual understanding by sharing their respective AI strategies, doctrines, and other related documents. The two should also set limitations on the deployment of AI weapon systems in sensitive areas and exercise restraint in employing AI in strategic command and control systems, particularly with respect to nuclear weapons. Furthermore, they should formulate bilateral or multilateral agreements that prohibit attacks on nuclear C4ISR systems. Finally, they should work to prevent the use of autonomous weapons against other countries’ strategic assets, including missile submarines, intercontinental ballistic missiles, and second-strike countermeasure systems.

#### SCS conflict draws in NATO and goes nuclear

Polina **Tikhonova 15**. Writer, journalist and a certified translator. Over the past 7 years, she has worked for a wide variety of top European, American, Russian, and Ukrainian media outlets. Polina holds a Master's Degree in English Philology from the University of Oxford and a Bachelor's Degree in Journalism from the Saint Petersburg State University, 11-28-2015, "US Faces Nuclear War Threat Over South China Sea," ValueWalk, http://www.valuewalk.com/2015/11/us-nuclear-war-south-china-sea/

China is willing to start a nuclear war with the United States over the South China Sea, according to a Chinese professor. Beijing’s rhetoric after an incident with a U.S. warship sailed to the South China Sea suggests that Chinese decision-makers could resort to more “concrete and forceful measures” to counter the U.S. Navy, according to Zhang Baohui, Professor of Political Science and Director of the Centre for Asian Pacific Studies at Lingnan University in Hong Kong. “If so, a face-off between the two navies becomes inevitable. Even worse, the face-off may trigger an escalation towards military conflicts,” the professor wrote in a piece for RSIS Commentary. But, according to Baohui, the U.S. military is “oblivious” to this scenario, since Washington decision-makers think America’s conventional military superiority discourages China from responding to such “provocations” in the South China Sea militarily. However, this “U.S. expectation is flawed, as China is a major nuclear power,” the professor wrote. “When cornered, nuclear-armed states can threaten asymmetric escalation to deter an adversary from harming its key interests,” he added. Baohui then refers to the military parade in Beijing that took place on Sept. 3 and revealed that China’s new generation of tactical missiles – such as the DF-26 – are capable of being armed with nuclear warheads. Moreover, according to the latest reports, China’s air-launched long-range cruise missiles can also carry tactical nuclear warheads. U.S. could provoke nuclear war with China And while the U.S. does not have its core interests in the South China Sea, the disputed islands present China’s strategic interests, which is why this kind of asymmetry in stakes would certainly give Beijing an advantage in “the balance of resolve” over Washington, according to the professor. And if the South China Sea situation escalates and starts spiraling into a nuclear confrontation between the U.S. and China, Washington will face a choice of either backing down first or fighting a nuclear-armed power and the world’s largest military force with a strength of approximately 2.285 million personnel. “Neither option is attractive and both exact high costs, either in reputation or human lives, for the U.S.,” Baohui wrote. So it would be unwise for the U.S. to further provoke China in the disputed area, since China’s willingness to defend its interests, reputation and deterrence credibility could easily escalate the conflict into a military confrontation that would ultimately harm U.S. interests, according to the professor. China will join Russia in nuclear war with NATO With NATO member state Turkey downing a Russian jet in its airspace, there is already a high risk of military confrontation in the world. And with China being so close and allied with Russia, Beijing decision-makers could see the incident with the Russian warplane as an opportunity to avenge the West for the South China Sea provocations. The Turkish military said it had shot down a Russian jet on Tuesday, triggering a furious response from Moscow and escalating the already hot tensions in the Syrian conflict. With Russian President Vladimir Putin warning the West of “serious consequences,” analysts believe the Kremlin is willing to unleash a nuclear war over the incident. Despite the fact that Turkey is backed by NATO’s 5th Article, which states that an attack on one Ally shall be considered an attack on all NATO members, the chances that Putin will start a nuclear war over the incident with the Russian jet are very “likely,” according to Pavel Felgengauer, Russia’s most respected military analyst. Felgengauer said Turkey wants to protect a zone in northern Syria controlled by the Turkmens, Ankara’s allies, while the downing of the Russian warplane in the region must prompt the Kremlin to either accept the zone or “start a war with Turkey,” which means starting an all-out war with NATO. And the only way Russia could win a war against NATO is by going nuclear, Felgengauer said. “It is most likely that it will be war,” said Felgenhauer, as reported by Mirror. “In other words, more fights will follow when Russian planes attack Turkish aircraft in order to protect our [Russia’s] bombers. It is possible that there will be fights between the Russian and Turkish navies at sea.” U.S. provokes China to respond militarily The U.S. recently asserted its freedom of navigation in the disputed South China Sea. On Oct. 27, the USS Lassen traveled inside the 12-mile nautical zone around Subi Reef in the Spratly Islands archipelago. This reef is one of seven reefs China has artificially built in order to claim its sovereignty over the Spratly Islands and the sea around it. Even though Beijing did not take immediate action to counter the U.S. vessel, such further “provocations” could seriously destabilize the peace and stability of the whole region, according to Baohui. “They could touch off an unintended escalation and push the two countries towards military conflict. The logic is quite obvious,” the professor wrote. The U.S. Navy’s further operations in the South China Sea could thus corner Beijing and force China to respond militarily. After all, China cannot risk its national interests and power reputation, according to the Chinese professor. Shortly after the incident, Vice-Admiral Yi Xiaoguang, the Chinese People’s Liberation Army’s (PLA) deputy chief of staff, warned that China “will use all means necessary to defend its sovereignty” if the U.S. conducts similar provocations. China: we can seize more islands in the South China Sea China recently said it can use military force to kick out nations illegally to seize more islands in the disputed South China Sea, but China is now showing restraint, as reported by ValueWalk last week. “The Chinese government has the right and the ability to recover the islands and reefs illegally occupied by neighboring countries,” Vice Foreign Minister Liu Zhenmin said, speaking about the disputed artificial islands but not naming any particular country. China, Vietnam, the Philippines, Malaysia, Taiwan and Brunei all have sovereignty claims in the South China Sea. All but Brunei have military fortifications in the disputed area, which raises concerns about a high risk of military confrontation in the region. “But we haven’t done this [seized the islands]. We have maintained great restraint with the aim to preserve peace and stability in the South China Sea,” Liu said. If China gains complete control over the Spratly Islands, it gets the key to controlling waters through which $5 trillion in trade passes every year, mostly to and from China. The professor concluded that reckless actions by one or both parties may well turn mistrust into “bloody military conflicts.” But nobody, especially countries in the region, are interested in such a scenario. “If the US claims to be the defender of world peace and regional stability, it must do everything to avoid this scenario through unintended escalations,” Baohui wrote

#### Nuke war causes extinction – Ice Age, famines, and war won’t stay limited

Edwards 17 [Paul N. Edwards, CISAC’s William J. Perry Fellow in International Security at Stanford’s Freeman Spogli Institute for International Studies. Being interviewed by EarthSky. How nuclear war would affect Earth’s climate. September 8, 2017. earthsky.org/human-world/how-nuclear-war-would-affect-earths-climate] Note, we are only reading parts of the interview that are directly from Paul Edwards -- MMG

In the nuclear conversation, what are we not talking about that we should be?

We are not talking enough about the climatic effects of nuclear war. The “nuclear winter” theory of the mid-1980s played a significant role in the arms reductions of that period. But with the collapse of the Soviet Union and the reduction of U.S. and Russian nuclear arsenals, this aspect of nuclear war has faded from view. That’s not good. In the mid-2000s, climate scientists such as Alan Robock (Rutgers) took another look at nuclear winter theory. This time around, they used much-improved and much more detailed climate models than those available 20 years earlier. They also tested the potential effects of smaller nuclear exchanges. The result: an exchange involving just 50 nuclear weapons — the kind of thing we might see in an India-Pakistan war, for example — could loft 5 billion kilograms of smoke, soot and dust high into the stratosphere. That’s enough to cool the entire planet by about 2 degrees Fahrenheit (1.25 degrees Celsius) — about where we were during the Little Ice Age of the 17th century. Growing seasons could be shortened enough to create really significant food shortages. So the climatic effects of even a relatively small nuclear war would be planet-wide. What about a larger-scale conflict? A U.S.-Russia war currently seems unlikely, but if it were to occur, hundreds or even thousands of nuclear weapons might be launched. The climatic consequences would be catastrophic: global average temperatures would drop as much as 12 degrees Fahrenheit (7 degrees Celsius) for up to several years — temperatures last seen during the great ice ages. Meanwhile, smoke and dust circulating in the stratosphere would darken the atmosphere enough to inhibit photosynthesis, causing disastrous crop failures, widespread famine and massive ecological disruption. The effect would be similar to that of the giant meteor believed to be responsible for the extinction of the dinosaurs. This time, we would be the dinosaurs. Many people are concerned about North Korea’s advancing missile capabilities. Is nuclear war likely in your opinion? At this writing, I think we are closer to a nuclear war than we have been since the early 1960s. In the North Korea case, both Kim Jong-un and President Trump are bullies inclined to escalate confrontations. President Trump lacks impulse control, and there are precious few checks on his ability to initiate a nuclear strike. We have to hope that our generals, both inside and outside the White House, can rein him in. North Korea would most certainly “lose” a nuclear war with the United States. But many millions would die, including hundreds of thousands of Americans currently living in South Korea and Japan (probable North Korean targets). Such vast damage would be wrought in Korea, Japan and Pacific island territories (such as Guam) that any “victory” wouldn’t deserve the name. Not only would that region be left with horrible suffering amongst the survivors; it would also immediately face famine and rampant disease. Radioactive fallout from such a war would spread around the world, including to the U.S. It has been more than 70 years since the last time a nuclear bomb was used in warfare. What would be the effects on the environment and on human health today? To my knowledge, most of the changes in nuclear weapons technology since the 1950s have focused on making them smaller and lighter, and making delivery systems more accurate, rather than on changing their effects on the environment or on human health. So-called “battlefield” weapons with lower explosive yields are part of some arsenals now — but it’s quite unlikely that any exchange between two nuclear powers would stay limited to these smaller, less destructive bombs.

### 2

#### The member nations of the World Trade Organization except for the People’s Republic of China ought to reduce intellectual property protections for medicines by implementing a one-and-done approach for patent protection.

Solves 99% of case – other countries can do innovating

#### China is geared up to become Biotech lead.

CAS 7/20 [(CAS, a division of the American Chemical Society, partners with R&D organizations globally to provide actionable scientific insights that help them plan, innovate, protect their innovations, and predict how new markets and opportunities will evolve. Leverage our unparalleled content, specialized technology, and unmatched human expertise to customize solutions that will give your organization an information advantage.), “3 reasons biotech is booming in China: How can you capitalize on the growth?”, <https://www.cas.org/resources/blog/3-reasons-biotech-booming-china-how-can-you-capitalize-growth>, July 20, 2021] TDI

3 reasons biotech is booming in China: How can you capitalize on the growth?

This year marks the 40th anniversary of China's Reform and Opening Up policy, which was established in 1978. China’s embrace of economic reform and free-market principles has propelled unprecedented business and industry growth since that time, firmly securing its position as the world's second largest economy.

In light of the rise of China's economy, a number of global biotech companies—such as Denmark's Novo Nordisk—began to build an early presence there. Building on this foundation, within the past few years biotech has started to grow at an explosive rate in China. In fact, China's biotech industry is anticipated to exceed four percent of GDP by 2020.

Why is biotech betting big on China? Here, we explore three factors driving the country's recent biotech boom and what it means for those looking to capitalize on this growth

National innovation strategy attracting top talent

Ten years ago, a biotech specialist from China may have needed to look for international career opportunities. But today, thriving government programs and a surge of entrepreneurial investments have created more incentive than ever for top talent to establish careers in China.

The Chinese government has made it a priority to transform the country from a manufacturing to an innovation-driven economy by developing five-year national strategic plans that set economic and growth goals. The most recent plan, which put special focus on the biotech industry, outlines the development of 10 to 20 biomedicine life-science parks with an output surpassing $1.5 billion by 2020. This is in addition to the 100 life-science parks already established throughout the country, as well as $100 billion of government investments dedicated to innovation.

The government's Thousand Talents Plan—which encourages Chinese scientists, academics and entrepreneurs living abroad to return to China—has recruited 7,000 experts since 2008, with 1,400 of them recruited specifically by the life sciences committee for biotech.

The government has also heavily invested to enhance the intellectual property environment in China. The State Intellectual Property Office (SIPO), China's patent office, has received additional resources to address the growing volume of patent applications and has implemented an expedited examination process. In 2007, SIPO had 2,672 examiners dedicated to examining patents; by 2017, that number had grown to more than 11,500 (SIPO Annual Reports, 2007 and 2017). SIPO also offers attractive benefits to high-demand patent applications, such as covering filing fees and providing tax incentives and monetary rewards.

Beyond the government, Chinese venture capital and private equity funds raised $45 billion for life sciences in two and a half years, which contributed to the development of China's flourishing biotech start-up culture.

As a result of all of these factors driving innovation, patent applications have soared—more than 50,000 biotech patents were submitted in 2017, up from less than 20,000 in 2010. Some fields leading this growth are natural products, biologics and bioinformatics.

Chinese biotech patent applications

Chart, histogram

Description automatically generated

Growth in Chinese biotech patent application volume since 2000

Demand for new treatments creating an attractive market

According to the United Nations, China's population is ageing more rapidly than that of any other country. This fact, along with changing lifestyles and environmental concerns, is driving increasing rates of critical and chronic illness. For example, 36 percent of the world's lung cancer diagnoses come from China, yet the five-year lung cancer survival rate is currently 17 percent lower than the global average.

This market landscape creates surging demand for pioneering medical treatments, and investors are turning to Chinese scientists to develop solutions that could not only be sold in China, but enhance treatment worldwide.

Major pharmaceutical companies in the west are taking note as well and considering ways to bolster their presence in China as domestic investors gain market share, with many global leaders opening research centers in China and others coordinating research cooperation pacts with Chinese institutions.

Globalized approach to regulations easing market entry

In March 2018, the China Food and Drug Administration (CFDA) announced it will merge with other administrative bodies to form a national market supervision administration. As part of the restructuring, a new entity is being created that will focus primarily on medical technologies. This is expected to bring increased efficiency and consistency to regulation of pharmaceuticals and medical devices in China.

Further, in April 2018, the government launched initiatives to support generic drug research and development as a means to foster innovation and provide more accessible treatment options to Chinese patients. They include providing research grants, as well as expediting the review and approval process of generic drugs based on name-brand drugs with compulsory licenses.

These efforts are the latest in a series of reforms aimed at streamlining China's regulatory process to align with international standards. Last August, for example, the CFDA announced it had joined ICH, a global federation of medicines regulators that seeks to harmonize health technology regulations. It also announced it would allow data from clinical trials conducted outside of China to be admitted as part of regulatory filings, a move that fast-tracks new treatments from the lab to the clinic. Overall, these efforts to streamline China's regulatory processes and align them more closely with those outside of China eases entry into the Chinese market for domestic as well as foreign investors and also make it easier for Chinese firms to market their innovations internationally.

These developments, along with the impressive growth rate, clearly demonstrate that China is quickly establishing itself as the eastern hub for biotechnology innovation. Organizations looking for growth opportunities in biotech should certainly have China on their radar. However, a successful strategy for growth within any industry sector in China requires a deep understanding of the market and intellectual property landscape, as well as governmental and cultural factors.

#### **US biotech stocks down now.**

Gatlin 4/9 [(Allison, Author at Investor's Business Daily “Biotech Stocks Hit A Snag — Why Experts Say The Heyday Isn't Over“, Investor's Business Daily, ), 4-9-2021, https://www.investors.com/news/technology/biotech-stocks-why-they-have-skidded-why-experts-are-not-worried/)] TDI

Regulatory and drug-pricing worries have knocked biotech stocks off their Covid pedestal. After seeing massive gains in 2020 amid the Covid-19 vaccine heyday and hitting a high point in early February, biotech stocks have collectively pulled back 21%. Investors are uneasy after the Federal Trade Commission formed a working group to more deeply scrutinize pharmaceutical mergers. Meanwhile, the Food and Drug Administration has delayed a number of drug approvals, and Sen. Bernie Sanders, I-Vt., introduced sweeping drug-pricing legislation. All of this comes amid a backdrop of rising interest rates.

#### Their unq and il studies are just abt the US – Sequoia reads yellow

Feldman 1 Robin Feldman 2-11-2019 "‘One-and-done’ for new drugs could cut patent thickets and boost generic competition" <https://www.statnews.com/2019/02/11/drug-patent-protection-one-done/> (Arthur J. Goldberg Distinguished Professor of Law, Albert Abramson ’54 Distinguished Professor of Law Chair, and Director of the Center for Innovation)//SidK + Elmer

Drug companies **have brought great innovations** to market. Society rewards innovation with patents, or with non-patent exclusivities that can be obtained for activities such as testing drugs in children, undertaking new clinical studies, or developing orphan drugs. The rights provided by patents or non-patent exclusivities provide a defined time period of protection so companies can recoup their investments by charging monopoly prices. When patents end, lower-priced competitors should be able to jump into the market and drive down the price. **But that’s not happening**. Instead, drug companies build massive patent walls around their products, extending the protection **over and over again**. Some modern drugs have an avalanche of U.S. patents, with expiration dates **staggered across time**. For example, the rheumatoid arthritis drug Humira is **protected by more than 100 patents**. Walls like that **are insurmountable**. Rather than rewarding innovation, our patent system is now largely repurposing drugs. Between 2005 and 2015, **more than three-quarters** of the drugs associated with new patents **were not new ones** coming on the market but existing ones. In other words, we are mostly churning and recycling. Particularly troubling, new patents can be **obtained on minor tweaks** such as adjustments to dosage or delivery systems — a once-a-day pill instead of a twice-a-day one; a capsule rather than a tablet. Tinkering like this may have some value to some patients, but it nowhere near justifies the rewards we lavish on companies for doing it. From society’s standpoint, incentives should drive scientists back to the lab to look for new things, not to recycle existing drugs for minimal benefit.

Feldman 2 Robin Feldman 18, May your drug price be evergreen, Journal of Law and the Biosciences, Volume 5, Issue 3, December 2018, Pages 590–647, <https://doi.org/10.1093/jlb/lsy022> Arthur J. Goldberg Distinguished Professor of Law, Albert Abramson ’54 Distinguished Professor of Law Chair, and Director of the Center for Innovation (Study Notes: Presenting the first comprehensive study of evergreening, this article examines the extent to which evergreening behavior—which can be defined as artificially extending the protection cliff—may contribute to the problem. The author analyses all drugs on the market between 2005 and 2015, combing through 60,000 data points to examine every instance in which a company added a new patent or exclusivity.)//sid

The study results demonstrate definitively that the pharmaceutical industry has strayed far from the patent system's intended design. The patent system is not functioning as a time-limited opportunity to garner a return, followed by open competition. Rather, companies throughout the industry seek and obtain repeated extensions of their competition-free zones. Moreover, the incidence of such behavior has steadily increased between 2005 and 2015, especially on the patent front and for certain highly valuable exclusivities. Most troubling, the data suggest that the current state of affairs **is harming innovation** in tangible ways. Rather than creating new medicines—sallying forth into new frontiers for the benefit of society—drug companies are focusing their time and effort extending the patent life of old products. This, of course, is not the innovation one would hope for. The greatest creativity at pharmaceutical **companies should be in the lab, not in the legal department**.115 The following sections describe the results obtained through our analysis in detail, but below are the key takeaways from the study: Rather than creating new medicines, pharmaceutical companies are recycling and repurposing old ones. In fact, 78% of the drugs associated with new patents in the FDA’s records were not new drugs coming on the market, but existing drugs. In some years, the percentage reached as high as 80%. Adding new patents and exclusivities to extend the protection cliff is particularly pronounced among blockbuster drugs. Of the roughly 100 best-selling drugs, more than 70% extended their protection at least once, with more than 50% extending the protection cliff more than once. Looking at the full group, almost 40% of all drugs available on the market created additional market barriers by having patents or exclusivities added to them. Many of the drugs adding to the Orange Book are ‘serial offenders’—returning to the well repeatedly for new patents and exclusivities. Of the drugs that had an addition to the Orange Book, 80% of those had an addition to the Orange Book on more than one occasion, and almost half of these drugs had additions to the Orange Book on four or more occasions. The number of drugs with a high quantity of added patents in a single year has substantially increased. For example, the number of drugs with three or more patents added to them in one year has doubled. Similarly, the number of drugs with five or more added patents has also doubled. Overall, the quantity of patents added to the Orange Book has more than doubled, increasing from 349 patents added in the year 2005 to 723 in 2015. The number of drugs that had a patent added to them in the Orange Book almost doubled. There were striking increases in certain exclusivities, such as orphan drug exclusivity, new patient population exclusivity, and new product exclusivity. In particular, the number of drugs with an added orphan drug exclusivity tripled. In addition, the number of times a use code was added to a patent more than tripled, suggesting that this has become a new favored game. To provide a broad sense of the types of metrics we are using, some could be characterized as ‘intensity’ measures, which capture the breadth and depth of patent and exclusivity activity in the industry. Another set of our metrics can be characterized as ‘temporal’ measures, which evaluate whether there are any trends in the behavior under examination across time during our 11-year timeframe from 2005 to 2015.

Arnold Ventures 20 9-24-2020 "'Evergreening' Stunts Competition, Costs Consumers and Taxpayers" <https://www.arnoldventures.org/stories/evergreening-stunts-competition-costs-consumers-and-taxpayers/> (Arnold Ventures is focused on evidence-based giving in a wide range of categories including: criminal justice, education, health care, and public finance)//Elmer

In 2011, Elsa Dixler was diagnosed with multiple myeloma. That August, she was prescribed Revlimid, a drug that had come on the market six years earlier. By January 2012, she went into full remission, where she has remained since. So long as Revlimid retains its effectiveness, she will take it for the rest of her life. “I was able to go back to work, see my daughter receive her Ph.D, and have a pretty normal life,” said Dixler, a Brooklyn resident who is now 74. “So, on the one hand, I feel enormously grateful.” But Dixler’s normal life has come at a steep financial cost to her family and to taxpayers. Revlimid typically costs nearly $800 per capsule, and Dixler takes one capsule per day for 21 days, then seven days off, and then resumes her daily dose, requiring 273 capsules a year. Since retiring from The New York Times at the end of 2017, she has been on Medicare. Dixler entered the Part D coverage gap (known as the donut hole) “within minutes,” she said. She estimates that adding her deductible, her copayment of $12,000, and what her Part D insurance provider pays totals approximately $197,500 a year. Revlimid should have **been subject to competition** from generic drug makers starting in 2009, bringing down its cost by many orders of magnitude. But by obtaining **27 additional patents**, eight orphan drug exclusivities and 91 total additional protections from the U.S. Food and Drug Administration (FDA) since Revlimid’s introduction in 2005, its manufacturer, Celgene, has extended the drug’s **monopoly** **period** **by 18 years** — through March 8, 2028. “I cannot fathom the immorality of a business that relies on **squeezing people with cancer**,” Dixler said, noting her astonishment that Revlimid has obtained orphan drug protections when it treats a disease that is not rare and does not serve a very limited population. She also observed that Revlimid’s underlying drug is thalidomide, which has been around for decades. “They didn’t invent a new drug, rather, they found a new use for it,” she said. “The cost of Revlimid has imposed constraints on our retirement,” Dixler said, “but when I hear other people’s stories, I feel very lucky. A lot of people have been devastated financially.” Revlimid is a case study in a process known as “evergreening” — artificially sustaining a monopoly for years and even decades by manipulating intellectual property laws and regulations. Evergreening is most commonly used with blockbuster drugs generating the highest prices and profits. **Of the roughly 100 best-selling drugs, more than 70 percent have extended their protection** from competition at least once. More than half have extended the protection cliff multiple times. The true scope and cost of evergreening has been brought into sharper focus by a groundbreaking, publicly available, comprehensive database released Thursday by the Center for Innovation at the University of California Hastings College of Law and supported by Arnold Ventures. **The Evergreen Drug Patent Search is the first database** to **exhaustively track the patent protections filed by pharmaceutical companies**. **Using data from 2005 to 2018 on brand-name drugs listed in the FDA’s Orange Book** — a listing of relevant patents for brand name, small molecule drugs — it **demonstrates** the full extent of **how evergreening has been used by Big Pharma to prolong patents and delay the entry of generic, lower-cost competition. “Competition is the backbone of the U.S.** economy,” said Professor Robin Feldman, Director of the UC Hastings Center for Innovation, who spearheaded the database’s creation. “But it’s not what we’re seeing in the drug industry. “With evergreening, pharmaceutical companies repeatedly make slight, often trivial, modifications to drugs, dosage levels, delivery systems or other aspects to obtain new protections,” she said. “They pile these protections on over and over again — so often that 78 percent of the drugs associated with new patents were not new drugs coming on the market, but existing drugs.” Competition is the backbone of the U.S. economy. But it’s not what we’re **seeing in the drug industry**. Professor Robin Feldman Director of the UC Hastings Center for Innovation In recent decades, evergreening has systematically undermined the Drug Price Competition and Patent Term Restoration Act of 1984, which created the generic drug industry. Commonly known as the Hatch-Waxman Act, it established a new patent and market exclusivity regime in which new drugs are protected from competition for a specified period of time sufficient to allow manufacturers to recoup their investments and earn a reasonable profit. When that protection expires, generic drug makers are incentivized to enter the market through a streamlined regulatory and judicial process. Drug prices typically drop by as much as 20 percent when the first generic enters the market**, and with more than one generic manufacturer, prices can plummet by 80 to 85 percent**. “Hatch-Waxman created an innovation/reward/competition cycle, but it’s been distorted into an innovation/reward/more reward cycle,” Feldman said. “To paraphrase something a former FDA commissioner once said, the greatest creativity in Big Pharma should come from the research and development departments, not from the legal and marketing departments.” Feldman led the development of the Evergreen Drug Patent Search in **response to repeated requests from Congressional committees, members of Congress,** state regulators and journalists for information about specific drugs and companies. “We want to make it so anyone can have the question about drug protections at their fingertips whenever they want,” Feldman said. “It’s designed to be easy and user-friendly, and to enhance public understanding about how competition may be limited rather than enhanced through the drug patent system.” The **database** was **created through** a painstaking process of **combing** through **160,000 data points** **to examine every instance where a pharmaceutical company added a new drug patent or exclusivity**. “Most of it was done by hand,” Feldman said, “with multiple people reviewing it at every stage. And along the way we repeatedly made conservative choices. **We erred on the side of underrepresenting the evergreen gain** to be sure we were as fair and reasonable as possible.” Among the 2,065 drugs covered in Evergreen Drug Patent Search, there are many examples of the evergreening strategy used by pharma to delay the entry of competition, especially generics, often for widely prescribed drugs, including those used to treat heartburn, chronic pain, and opioid addiction. Nexium Before Nexium, there was Prilosec, a popular drug to treat gastroesophageal reflux disease (GERD). But its patent exclusivity was due to expire in April 2001. In the late 1990s, with a precipitous drop in revenue looming, Prilosec’s manufacturer, AstraZeneca, decided to develop a replacement drug. Using “one-half of the Prilosec molecule — an isomer of it,” the result was Nexium, which received approval in February 2001. Essentially an evergreened version of Prilosec, Nexium’s exclusivity was then extended by more than 15 years, as AstraZeneca received 97 protections stemming from 16 patents. These included revised dosages, compounds, and formulations. Feldman said that tinkering changes such as Nexium’s do not involve the substantial research and development required for a new drug, nor do they constitute true innovations, yet for a decade and a half, patients and taxpayers were forced to pay far more than was warranted for GERD relief. In fact, in 2016 — one year after patent exclusivity expired — Nexium still topped all drugs in Medicare Part D spending, totaling $1.06 billion. Suboxone Use of this combination of buprenorphine and naloxone for treating opioid addiction has exploded in the wake of the opioid epidemic. Since its approval, Suboxone’s manufacturer, Reckitt Benckiser (now operating as Indivior), extended its protection cliff eight times, gaining nearly two extra decades of exclusivity through early 2030. The drug maker gained six patents for creating a film version of the drug — notably around the time protection was expiring for its tablet version. (The therapeutic benefits of the film and tablet are identical.) An earlier version of Suboxone also obtained an orphan drug designation, despite an opioid epidemic that has expanded Suboxone’s customer base to millions of potential customers. Suboxone generates more than $1 billion in annual revenue and ranks among the 40 top-selling drugs in the U.S. Truvada When Truvada, commonly referred to as PrEP, was approved in 2004, this HIV-prevention drug was a breakthrough. But 16 years later — and 14 years after its original exclusivity was to expire — it retains its monopoly status. Truvada’s manufacturer, Gilead, has received 15 patents and 120 protections since it came on the market, extending its exclusivity for more than 17 years, until July 3, 2024. In countries where generic Truvada is available, PrEP costs $100 or less per month, compared to $1,600 to $2,000 in the U.S. As a result, Truvada is unaffordable to many people **who need protection from HIV**. Barred from access, they are left vulnerable to infection. “We’re establishing a precedent that a pharmaceutical company can charge whatever it wants even as it allows an epidemic to continue, and the government refuses to intervene,” said James Krellenstein, co-founder of the group PrEP4All. “That should scare every American. If it’s HIV today, it will be another disease tomorrow.” EpiPen First approved in 1987, the EpiPen has saved the lives of countless numbers of people with deadly allergies. But it is protected from competition until 2025 — 38 years after its introduction — because its owner, Mylan, has filed five patents, four since 2010, all involving tweaks to the automatic injector. The actual medication used, epinephrine, has existed for more than a century — the innovation here is in the delivery device. Because these small changes to the injector have maintained its monopoly for so long, the cost of an EpiPen package (containing two injectors) has risen from $94 when Mylan purchased the device to between $650 and $700 today. For many people, especially parents of children with severe reactions to common allergens like peanuts, EpiPen’s increasing price tag imposes an onerous financial burden. What Can Be Done As the Evergreen Drug Patent Search makes clear, the positive impact of Hatch-Waxman has been steadily and severely eroded by a regulatory system vulnerable to increasingly sophisticated forms of manipulation. “You might say that the patent and regulatory system has been weaponized,” Feldman said. “When billions of dollars are at stake, there’s a lot of money available to look for ways to exploit the legal system. And companies have become adept at this, as our work has found.” There are several key steps that Congress could take to restore the balance between innovation and competition that is the key to a successful prescription drug regulatory process. These may include: Imposing restrictions on the number of patents that prescription drug manufacturers can defend in court to discourage the use of anticompetitive patent thickets. Limiting the patentability of so-called secondary patents — which don’t improve the safety or efficacy of a drug — through patent and exclusivity reform. Reforming the 180-day generic exclusivity, which can currently be abused to block other competitive therapies. “**The Evergreen Drug Patent Search provides the publicly available, evidence-based foundation that defines the extent of the problem**, and it can be used to develop policies that solve the problem of anti-competitive patent abuses,” said Kristi Martin, VP of Drug Pricing at Arnold Ventures. “Our incentives have gotten out of whack,” Martin said. “The luxury of monopoly protection should only be provided to innovations that provide meaningful benefits in saving lives, curing illnesses, or improving the quality of people’s lives. It should not be provided to those gaming the system. If we can change that, we can save consumers, employers, and taxpayers many billions of dollars while increasing the incentives for pharmaceutical companies to achieve breakthroughs."

#### CP solves innovation in every other country BUT reversing Chinese lead is key. They can’t get out of this otherwise the aff has zero solvency.

#### Chinese tech leadership leads to nuclear war

Kroenig 18 (Matthew, Deputy Director for Strategy, Scowcroft Center for Strategy and Security Associate Professor of Government and Foreign Service, Georgetown University) “Will disruptive technology cause nuclear war?” *BAS*, Nov 12, 2018, <https://thebulletin.org/2018/11/will-disruptive-technology-cause-nuclear-war>

Recently, analysts have argued that emerging technologies with military applications may undermine nuclear stability (see here, here, and here), but the logic of these arguments is debatable and overlooks a more straightforward reason why new technology might cause nuclear conflict: by upending the existing balance of power among nuclear-armed states. This latter concern is more probable and dangerous and demands an immediate policy response. For more than 70 years, the world has avoided major power conflict, and many attribute this era of peace to nuclear weapons. In situations of mutually assured destruction (MAD), neither side has an incentive to start a conflict because doing so will only result in its own annihilation. The key to this model of deterrence is the maintenance of secure second-strike capabilities—the ability to absorb an enemy nuclear attack and respond with a devastating counterattack. Recently analysts have begun to worry, however, that new strategic military technologies may make it possible for a state to conduct a successful first strike on an enemy. For example, Chinese colleagues have complained to me in Track II dialogues that the United States may decide to launch a sophisticated cyberattack against Chinese nuclear command and control, essentially turning off China’s nuclear forces. Then, Washington will follow up with a massive strike with conventional cruise and hypersonic missiles to destroy China’s nuclear weapons. Finally, if any Chinese forces happen to survive, the United States can simply mop up China’s ragged retaliatory strike with advanced missile defenses. China will be disarmed and US nuclear weapons will still be sitting on the shelf, untouched. If the United States, or any other state acquires such a first-strike capability, then the logic of MAD would be undermined. Washington may be tempted to launch a nuclear first strike. Or China may choose instead to use its nuclear weapons early in a conflict before they can be wiped out—the so-called “use ‘em or lose ‘em” problem. According to this logic, therefore, the appropriate policy response would be to ban outright or control any new weapon systems that might threaten second-strike capabilities. This way of thinking about new technology and stability, however, is open to question. Would any US president truly decide to launch a massive, bolt-out-of-the-blue nuclear attack because he or she thought s/he could get away with it? And why does it make sense for the country in the inferior position, in this case China, to intentionally start a nuclear war that it will almost certainly lose? More important, this conceptualization of how new technology affects stability is too narrow, focused exclusively on how new military technologies might be used against nuclear forces directly. Rather, we should think more broadly about how new technology might affect global politics, and, for this, it is helpful to turn to scholarly international relations theory. The dominant theory of the causes of war in the academy is the “bargaining model of war.” This theory identifies rapid shifts in the balance of power as a primary cause of conflict. International politics often presents states with conflicts that they can settle through peaceful bargaining, but when bargaining breaks down, war results. Shifts in the balance of power are problematic because they undermine effective bargaining. After all, why agree to a deal today if your bargaining position will be stronger tomorrow? And, a clear understanding of the military balance of power can contribute to peace. (Why start a war you are likely to lose?) But shifts in the balance of power muddy understandings of which states have the advantage. You may see where this is going. New technologies threaten to create potentially destabilizing shifts in the balance of power. For decades, stability in Europe and Asia has been supported by US military power. In recent years, however, the balance of power in Asia has begun to shift, as China has increased its military capabilities. Already, Beijing has become more assertive in the region, claiming contested territory in the South China Sea. And the results of Russia’s military modernization have been on full display in its ongoing intervention in Ukraine. Moreover, China may have the lead over the United States in emerging technologies that could be decisive for the future of military acquisitions and warfare, including 3D printing, hypersonic missiles, quantum computing, 5G wireless connectivity, and artificial intelligence (AI). And Russian President Vladimir Putin is building new unmanned vehicles while ominously declaring, “Whoever leads in AI will rule the world.” If China or Russia are able to incorporate new technologies into their militaries before the United States, then this could lead to the kind of rapid shift in the balance of power that often causes war. If Beijing believes emerging technologies provide it with a newfound, local military advantage over the United States, for example, it may be more willing than previously to initiate conflict over Taiwan. And if Putin thinks new tech has strengthened his hand, he may be more tempted to launch a Ukraine-style invasion of a NATO member. Either scenario could bring these nuclear powers into direct conflict with the United States, and once nuclear armed states are at war, there is an inherent risk of nuclear conflict through limited nuclear war strategies, nuclear brinkmanship, or simple accident or inadvertent escalation. This framing of the problem leads to a different set of policy implications. The concern is not simply technologies that threaten to undermine nuclear second-strike capabilities directly, but, rather, any technologies that can result in a meaningful shift in the broader balance of power. And the solution is not to preserve second-strike capabilities, but to preserve prevailing power balances more broadly. When it comes to new technology, this means that the United States should seek to maintain an innovation edge. Washington should also work with other states, including its nuclear-armed rivals, to develop a new set of arms control and nonproliferation agreements and export controls to deny these newer and potentially destabilizing technologies to potentially hostile states. These are no easy tasks, but the consequences of Washington losing the race for technological superiority to its autocratic challengers just might mean nuclear Armageddon.

### 3

#### Infrastructure is making halting progress via reconciliation – bipartisanship is key for Manchin and Republicans to not nuke it

Litvan 9/2 [Laura] “Manchin Jolts Democrats by Urging ‘Pause’ on $3.5 Trillion Bill,” Bloomberg, September 2, 2021, <https://www.bloomberg.com/news/articles/2021-09-02/manchin-tells-democrats-to-pause-on-biden-s-3-5-trillion-plan> TG

Senator Joe Manchin is demanding a “strategic pause” in action on President Joe Biden’s economic agenda, potentially imperiling the $3.5 trillion tax and spending package that Democratic leaders plan to push through Congress this fall.

The West Virginia Democrat, a linchpin vote in the evenly divided Senate, said at an event in his home state on Wednesday and in a Thursday Wall Street Journal op-ed that rising inflation and a soaring national debt necessitate a go-slow approach and a “significantly” smaller plan than the one Democratic leaders and the White House have endorsed.

“By placing a strategic pause on this budgetary proposal, by significantly reducing the size of any possible reconciliation bill to only what America can afford and needs to spend, we can and will build a better and stronger nation for all our families,” Manchin said in the op-ed.

Manchin’s resistance to the core of Biden’s economic plan caps a politically painful month for a White House that has grappled with a chaotic withdrawal from Afghanistan, a resurgent pandemic and a massive hurricane that cut a path of death and damage from Louisiana to New York.

In comments Wednesday at an event hosted by the West Virginia Chamber of Commerce, the moderate Democrat said his party should “hit the pause button.” Lawmakers, he said, have too many other pressing issues before them, including heightening national security concerns after the Taliban takeover of Afghanistan.

“Let’s sit back. Let’s see what happens. We have so much on our plate,” he said.

Manchin’s comments come as Democratic leaders and committee chairs in the Senate and House work out the specifics of the economic package, with a goal of moving it through Congress soon after lawmakers return from a recess later this month. All members of the Senate Democratic caucus would have to back the measure for it to get the 51 votes needed to pass, with Vice President Kamala Harris providing the tie-breaking vote.

A spokesman for Senate Majority Leader Chuck Schumer didn’t immediately respond to a request for comment about Manchin’s request, and White House Press Secretary Jen Psaki did not immediately provide a comment.

The chair of the Congressional Progressive Caucus, Representative Pramila Jayapal, replied “Absolutely not” on Twitter to Manchin’s idea of a pause.

The spending package also is facing obstacles in the House. Democrats can only afford three defections in that chamber if Republicans are united in opposition, and some moderate Democrats also are balking at the size of the package being drawn up.

Manchin also called on the House to pass within a few weeks a Senate-passed $550 billion bipartisan infrastructure bill. House Speaker Nancy Pelosi has promised progressives in the chamber that she will marry that legislation with the much bigger Democrat-only tax-and-spending package, although moderates have been promised an infrastructure vote by late September.

#### General bipartisanship could spark compromise but the plan’s partisan nature tanks any shot

Montanari 21 “Biden’s Undermining Of U.S. Intellectual Property Rights Is Dangerous And Will Hurt Pandemic Response,” Lorenzo Montanari [executive director of Property Rights Alliance, an advocacy policy group in charge of publishing the International Property Rights Index], May 12, 2021 <https://www.forbes.com/sites/lorenzomontanari/2021/05/12/bidens-undermining-of-us-intellectual-property-rights-is-dangerous-and-will-hurt-pandemic-response/?sh=4a74c5004890> SM

Republican Congressman Byron Donalds (R-Fla.) is working on a new piece of legislation titled "Preventing Foreign Attempts to Erode Healthcare Innovation Act” to block the White House IP waiver position and to "prevent the Biden Administration from senselessly giving away America's intellectual property to countries like China”. IP rights are enshrined in Article 1, Section 8, Clause 8 of the U.S. Constitution of 1787, “To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.” As a central pillar to American history and constitutionalism for 244 years, IP converges tradition and progress to enrich the lives of citizens and society.

Waiving IP rights not only goes directly against America’s core values and threatens public health but wanes potential for bipartisan efforts. “Congress has spent decades wrangling over the contours of patent protections,” WSJ’s Kimberley A. Strassel says, “producing bipartisan legislation from the Bayh-Dole Act of 1980 and the Hatch-Waxman Act of 1984 to the Leahy-Smith Act of 2011.” All these bipartisan efforts to defend American inventors with a strong and fair IP system risk being seriously damaged with this Biden move.

#### Comprehensive infrastructure investment is key to all facets of the economy

Condon 2/21 [(Christopher, overing the Treasury and U.S. economic policy at Bloomberg News, with Erik Wasson) “Biden’s Economic Legacy at Stake as Next Package Takes Shape,” *Bloomberg*, 2-21-2021, <https://www.bloomberg.com/news/articles/2021-02-21/biden-s-economic-legacy-at-stake-with-next-package-taking-shape>] TDI

The next phase of President Joe Biden’s legislative agenda is fast taking shape, with an economic-recovery package that will potentially far surpass his $1.9 trillion virus-relief plan in size, complexity and overall ambition. The White House and congressional Democrats are busy plotting strategy for the proposal, which could be unveiled next month, kicking off a legislative process that may culminate by August. The centerpiece will be possibly the biggest infrastructure-spending commitment since the New Deal -- including roads, bridges and rural broadband internet. Progressives are eyeing much more, such as an expansion of Obamacare and a public-sector jobs program, along with tax measures including an increase in the capital-gains levy. But stuffing it with too many controversial proposals could threaten its approval or force it to be broken up, and put in peril the Democrats’ thin majorities in the 2022 midterm elections. Still, Democrats see a narrow opening to forge Biden’s legacy: not just restoring the U.S. economy to its pre-pandemic state, but reversing the trend of sluggish growth in recent years with the most far-reaching measures in decades. U.S. economy has put up more moderate growth in the 2000s versus heydays Biden’s virus-relief package is “going to help us get us back on the growth pattern we were on before,” said Virginia Representative Don Beyer, who, as incoming chair of the Joint Economic Committee, is a leading Democratic macroeconomic-policy voice. “The genius of the second plan is that it gives us the opportunity to punch GDP up above the long-term trend,” he said in an interview. During his campaign, Biden proposed $2 trillion for economic rebuilding, a step up from the $1.5 trillion level proposed in the House last year, which Democrats are now calling a “floor.” China Card Biden is aiming to succeed where Donald Trump and other predecessors have failed, when funding disputes stymied measures that economists say are vital to boosting long-term productivity. The president is selling the package as a way to counter China, which has deployed public investment not only to boost its own growth but to build global influence as well. As challenging as it may be to enact, such arguments may make the core infrastructure piece likely to be the easiest component to get through Congress. Bipartisan support for improved highway, transit, waterway and flood-mitigation work is strong, while deficit concerns are at the lowest level in decades. There’s also a Sept. 30 deadline in Congress for reauthorizing surface-transportation funding -- offering a ready-made vehicle for pursuing infrastructure measures. “Much of our infrastructure is nearing the end of its useful design life,” said Thomas Smith, executive director of the American Society of Civil Engineers, which will issue its latest quadrennial report card on U.S. infrastructure on March 3. “We’ve neglected it for far too long, and we’ve watched other countries continue to invest and continue to move ahead of the United States.” The ASCE’s last assessment, in 2017, was a D+. Back then, it estimated the U.S. needed $4.5 trillion in infrastructure spending over the following 10 years. With about $2.5 trillion in estimated outlays already in train, that left a $2 trillion gap -- which Biden’s proposal could largely fill. Congressional Budget Office figures indicate that a $1.5 trillion package would be equivalent to all federal spending on transportation and water infrastructure in the 14 years through 2017. The Senate Environment and Public Works Committee plans a hearing on transportation investment on Wednesday, when Michigan Governor Gretchen Whitmer, a Democrat, and Maryland Governor Larry Hogan, a Republican, are scheduled to testify. But infrastructure could become ensnared by a push among liberal lawmakers to tack on a raft of other items, from creating a government-run health insurance plan and making unionization easier, to a pathway to citizenship for undocumented immigrants and a carbon tax. Political Risk Meanwhile, House moderates in swing districts are facing the perils of redistricting ahead of the midterms, and could insist on limiting the scope of the bill to rein in its cost and limit partisan battles. Fights could also emerge over formulas for divvying up the money among states and cities. Congressional Progressive Caucus Chair Pramila Jayapal said Thursday her large cohort of House Democrats will decide in the coming weeks which elements to advocate in the package -- including whether to use it as an opportunity to roll back Trump’s tax cuts for the wealthy. Jayapal’s group was instrumental in attaching to the pandemic-relief plan an increase in the hourly minimum wage to $15, something that’s become easily the most controversial potential holdup for that bill. The progressive caucus has proposed a $2 trillion infrastructure bill, and is already advocating that it include expanded child and elder care. The question of funding, whether by raising taxes or issuing more debt, also looms large, and many Republicans are set to be vociferous in opposing much of the plan. Senate Finance Committee Chairman Ron Wyden is expected to propose tax hikes, including equalizing ordinary income and capital-gains levies for those making more than $1 million a year and ending the deferral of capital gains. He’d also change international tax provisions in the 2017 tax law and close the carried-interest loophole, according to a Democratic aide. Some lawmakers favor raising the federal gasoline tax -- now 18.4 cents a gallon and 24.4 cents for diesel -- for the first time since 1993, though Wyden in 2019 expressed opposition to the idea, calling it regressive. Treasury Secretary Janet Yellen, who argues that deficit spending makes more sense with interest rates historically low, said on CNBC last week that “certainly part of the package, the parts that are permanent, will be paid for in order to not raise long-term deficits.” While the yield on 10-year Treasury notes has risen markedly in recent weeks, Friday’s level of 1.34% is far below the 50-year average of about 6.16%. U.S. government's borrowing costs are historically low “There’s a lot of appetite to do something this year,” said Jeff Davis, a senior fellow at the Eno Center for Transportation. “But there seems to be no appetite to pay for it.” Despite all the hurdles, Biden has a strong hand. Upgrading and maintaining infrastructure acts as its own stimulus, unleashing real demand for equipment makers, materials suppliers and, most importantly, workers. Nucor Corp., Cleveland-Cliffs Inc. and U.S. Steel Corp., the country’s three largest steel producers, have been lobbying through their industry groups since the election to persuade lawmakers to back whatever infrastructure package the Biden administration puts forth. Productivity Potential Such spending would also be a huge boon for Caterpillar Inc., one of the world’s largest machinery makers, which attributed a drop in North American construction-equipment sales to weaker demand for pipelines and road construction. There’s also the potential for a long-term payoff, if investments translate into productivity gains -- such as savings on shipping and commuting costs when roads, rails and ports are improved, or avoiding the kind of power-grid failures on display this month in Texas. “We cannot throw all fiscal discipline to the wind, but the standards for fiscal prudence have indeed changed in light of the global decline in the normal structure of interest rates,” said David Wilcox, a senior fellow at the Peterson Institute for International Economics, and a former Federal Reserve and Treasury official. “If the rate of return on an investment exceeds your borrowing cost, it makes sense to do that investment, and with lower borrowing costs, more investments today can clear that bar.”

#### Post-COVID economic rebound secures geopolitical dominance---the alternative is global conflict, EU collapse and Chinese authoritarian dominance

Kempe 20 [(Frederick, best-selling author, prize-winning journalist and president & CEO of the Atlantic Council, one of the United States’ most influential think tanks on global affairs. He worked at The Wall Street Journal for more than 25 years as a foreign correspondent, assistant managing editor and as the longest-serving editor of the paper’s European edition.) “Op-ed: How the US can win the post-coronavirus race for global dominance,” CNBC, 4-18-2020, https://www.cnbc.com/2020/04/18/op-ed-how-us-can-win-the-post-coronavirus-race-for-global-dominance.html] TDI

Place your bets for the coming race to growth. It will be an epic contest among the world’s most significant economies, with generational and geopolitical consequences. For context, think back to what the United States accomplished after World War II, when it rose as an economic power to shape a better world. The post-COVID19 race could determine whether the U.S. rebounds in a manner that allows it to retain the mantle of global leadership. More likely for the moment, Beijing could leverage its first-mover advantage – alongside a faster economic recovery across Asian markets – accelerating the trend toward a Chinese-centric globalization. Elsewhere, as President Macron [argued](https://www.ft.com/content/3ea8d790-7fd1-11ea-8fdb-7ec06edeef84) this week to the Financial Times, the coming months could determine whether the European Union collapses as a political and economic project. The days ahead also could trigger a dangerous widening of the economic gap between emerging markets and the developed world – with escalating conflict and surging migration. It may seem premature to reflect on which of the globe’s economies is likely to have the most robust and lasting economic comeback – and with what geopolitical impact. After all, this was a week in which the International Monetary Fund [projected](https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020) a 3% contraction in global GDP for 2020, the most dramatic drop since the Great Depression. Yet it is the details behind that dismal forecast that should raise concerns within the U.S. and Europe. Their steeper economic decline and slower recovery could lay the seeds for a long-lasting shift of global tectonic plates to China’s advantage. The IMF projected a U.S. economic decline of about 6% in 2020 and a contraction of the eurozone of 7.5%. That compares to projected Chinese economic growth for 2020 of 1.2% after a first quarter real decline of 6.7% – far less than the 10%-plus dip many experts had expected. The only group of countries in the world projected to be in positive territory are East Asian, at roughly 1%. Even if one accepts that Chinese coronavirus fatalities likely are greater than their public figures and that the growth decline is likely larger, that doesn’t change the potential for a scenario that Deloitte and Salesforce this week [referred to](https://www2.deloitte.com/global/en/pages/about-deloitte/articles/covid-19/covid-19-scenarios-and-impacts-for-business-and-society-world-remade.html) as “Sunrise in the East.” Describing this scenario, as one of four possibilities they list, they write, “The global center of power shifts decisively east as China and other East Asian nations take the reigns as primary powers on the world stage and lead global coordination of the health system and other multilateral institutions.” That comes with the broader acceptance of greater surveillance mechanisms as part of the public good, a faster recovery of East Asian countries with less economic impact from COVID19, and a significant ramping up of Chinese foreign direct investment to burnish its global reputation. Still, the U.S. has a host of incumbent advantages that could serve it well if it uses its economic recovery to also strengthen its infrastructure, if it reverses runaway unemployment quickly, if it can tame political polarization and, most significantly, if it rediscovers its taste for collaborative global leadership. In the economic race, no advantage is greater than the dollar. China may be the world’s second largest economy, but the Chinese yuan [makes up](https://asiatimes.com/2019/12/yuan-globalization-remains-a-long-way-off/) only 2% of global payments and reserves while the dollar [accounts](https://asiatimes.com/2019/12/yuan-globalization-remains-a-long-way-off/) for roughly two thirds of foreign exchange reserves. The dollar [underpins](https://www.economist.com/finance-and-economics/2020/04/16/the-dollars-dominance-masks-chinas-rise-in-finance) four-fifths of global supply chains. The Economist [reckons](https://www.economist.com/finance-and-economics/2020/04/16/the-dollars-dominance-masks-chinas-rise-in-finance) China could chip away at U.S. economic advantages through three underestimated strengths of its own: as a trusted debtor, an attractive creditor, and increasingly as a tech partner. As a debtor, China’s $13 trillion bond market is the world’s second largest and [has weathered the crisis well](https://www.ft.com/content/41044876-6ab4-11ea-a3c9-1fe6fedcca75). Chinese debt [returned](https://www.cbsnews.com/news/china-cuts-us-treasury-debt-holding-by-13/) 1.3% in the first quarter, vastly better than the 15.5% [decline](https://www.economist.com/finance-and-economics/2020/04/16/the-dollars-dominance-masks-chinas-rise-in-finance) for other emerging market bonds. Over the same period, the Chinese market added $8.5 billion (60 billion yuan) in net inflows. As a creditor, China has remained willing and generous, an approach that served the U.S. well after World War II. For example, it [declared](https://www.ft.com/content/5f296d54-d29e-4e87-ae7d-95ca6c0598d5) its willingness to back a G20 deal to suspend bilateral loan repayments by poorer countries, a sizable benefit also at its own cost. On the tech front, few countries were as ready as China for money and people to go entirely online. Tencent and Ant Financial have more than a billion users each for their digital wallets, and they are expanding rapidly throughout Asia. OneConnect, an offshoot of China’s largest insurer, provides financial institutions in sixteen Asian countries with cloud-based services. So, what other advantages can the United States leverage in this race? Never underestimate the brittleness of an authoritarian country under stress. Its broad censorship, it’s opaque legal system, and the nature of its surveillance state are hardly models to emulate. Beyond that, Japanese Prime Minister Shinzo Abe is not alone [in proposing](https://asia.nikkei.com/Editor-s-Picks/China-up-close/Xi-fears-Japan-led-manufacturing-exodus-from-China) that his country relocate high-value supply chains from China. If many countries do the same, the manufacturing foundation of China’s economy could erode. The Financial Times’ Gideon Rachman [adds](https://www.ft.com/content/2e8c8f76-7cbd-11ea-8fdb-7ec06edeef84) that the global trust in the dollar is just one of two built-in U.S. advantages that are difficult to dislodge. The other? “Where, outside your home country, would you most like your children to go to university or to work?” he writes. Most significant in this race would be if the United States regained its appetite for political and economic leadership as the world’s premier “convening power.” That need not be done at the cost of China – or anyone else. The race still can be won if U.S. leaders see it as a marathon and recall that much of the world long embraced their global leadership because partners learned they were more likely to win as American partners. This economic rebound from COVID19 will be patchy and uneven. Being first out the gate will be significant, and that is likely to be China. Yet history has taught the United States that it’s victory will be longest lasting if it can achieved alongside partners and allies.

#### Nuclear war

Henricksen 17, emeritus senior fellow at the Hoover Institution (Thomas, “Post-American World Order,” *Hoover Institution*, <http://www.hoover.org/research/post-american-world-order>)

The tensions stoked by the assertive regimes in the Kremlin or Tiananmen Square could spark a political or military incident that might set off a chain reaction leading to a large-scale war. Historically, powerful rivalries nearly always lead to at least skirmishes, if not a full-blown war. The anomalous Cold War era spared the United States and Soviet Russia a direct conflict, largely from concerns that one would trigger a nuclear exchange destroying both states and much of the world. Such a repetition might reoccur in the unfolding three-cornered geopolitical world. It seems safe to acknowledge that an ascendant China and a resurgent Russia will persist in their geo-strategic ambitions. What Is To Be Done? The first marching order is to dodge any kind of perpetual war of the sort that George Orwell outlined in “1984,” which engulfed the three super states of Eastasia, Eurasia, and Oceania, and made possible the totalitarian Big Brother regime. A long-running Cold War-type confrontation would almost certainly take another form than the one that ran from 1945 until the downfall of the Soviet Union. What prescriptions can be offered in the face of the escalating competition among the three global powers? First, by staying militarily and economically strong, the United States will have the resources to deter its peers’ hawkish behavior that might otherwise trigger a major conflict. Judging by the history of the Cold War, the coming strategic chess match with Russia and China will prove tense and demanding—since all the countries boast nuclear arms and long-range ballistic missiles. Next, the United States should widen and sustain willing coalitions of partners, something at which America excels, and at which China and Russia fail conspicuously. There can be little room for error in fraught crises among nuclear-weaponized and hostile powers. Short- and long-term standoffs are likely, as they were during the Cold War. Thus, the playbook, in part, involves a waiting game in which each power looks to its rivals to suffer grievous internal problems which could entail a collapse, as happened to the Soviet Union.

### 4

#### Bipartisan antitrust bills passing now but continued PC needed to pacify republicans.

Perlman 9/3 [Matthew; 9/3/21; “*Interest Groups Back Big Tech Antitrust Bills In House,*” LAW360, <https://www.law360.com/competition/articles/1418789/interest-groups-back-big-tech-antitrust-bills-in-house>] Justin

Law360 (September 3, 2021, 7:25 PM EDT) -- A contingent of public interest groups are urging leaders of the U.S. House of Representatives to advance a package of legislation aimed at reining in Big Tech companies through updates and changes to antitrust law, though free market advocates have been jeering many of the bills. A total of 58 public interest and consumer advocacy groups signed on to a letter Thursday asking House leaders to swiftly pass the package of six antitrust bills that the Judiciary Committee approved in late June after a marathon markup session. The proposals include legislation prohibiting large platform companies from acquiring competitive threats, preferencing their own services and using their control of multiple business lines to disadvantage competitors in other ways. The proposals would also impose interoperability and data portability requirements on large tech platforms, increase merger filing fees and boost enforcement by state attorneys general. Charlotte Slaiman, competition policy director for Public Knowledge, which signed on to the letter, said in a statement Thursday that the package charts a path toward putting "people back in control of the digital economy." "The broad range of groups supporting this package shows just how widespread the problem of Big Tech dominance is, and that these bills deserve a full vote in the House imminently," Slaiman said. The letter contends that America has a monopoly problem that is resulting in lower wages, reduced innovation and increased inequality, while also undermining the free press and perpetuating "racial, gender and class dominance." "Big Tech monopolies are at the center of many of these problems," the letter said. "Reining in these companies is an essential first step to reverse the damage of concentrated corporate power throughout our economy." The proposals followed a 16-month investigation by the House antitrust subcommittee into Amazon, Apple, Facebook and Google that resulted in a sprawling report from Democratic members calling for a range of reform measures to rein in the dominance of the companies. While consumer advocacy groups have largely supported the measures, the tech companies themselves and other interest groups have been highly critical, including a coalition of more than 25 right-leaning groups that sent a letter to Congress ahead of the markup hearing. The letter called the bills a "Trojan horse package" aimed at cynically using conservative anger over Big Tech, particularly at perceived censorship by social media platforms, to seek bipartisan support for "European-style over-regulation." For its part, Facebook has called the proposals a "poison pill for America's tech industry at a time our economy can least afford it" and said the bills underestimate the fierce competition the U.S. companies face from abroad. Apple and Google also raised concerns about the impact the bills would have on innovation, as well as on privacy and security. And Amazon has warned about the potential consequences of the proposals for both small businesses that sell on its platform and the consumers who use it to shop. Ending Platform Monopolies Act Thursday's letter said that the Ending Platform Monopolies Act would address "the most problematic aspects of the Big Tech companies" by allowing enforcers to break-up or separate pieces of the businesses when they create conflicts of interest that give the platforms an advantage over potential competitors and business users. A fact sheet from Public Knowledge accompanying the letter said that the bill is an important tool to help the antitrust agencies "protect consumers from mammoth platforms and to ensure compliance with other parts of the package." But during the markup hearing, ranking Republican committee member Rep. Jim Jordan of Ohio blasted the bill as a regulatory overreach, calling it "quite literally central planning" and arguing that it has significant ambiguities, which is bad for business. The Competitive Enterprise Institute argued in a June statement that the bill "kills the goose that lays the golden egg," and would actually result in small businesses being unable to access the large platforms, which in turn would focus on their own offerings instead. The Chamber of Progress has warned that the proposal could bar Amazon from offering its Prime services and its Amazon Basics private label products, since they would compete against other sellers on the platform. Other groups have also warned it could also force tech companies to divest popular apps, including Google's Maps and YouTube, Facebook's WhatsApp and Instagram and Apple's iMessage and FaceTime. American Innovation and Choice Online Act The American Innovation and Choice Online Act is aimed at barring the platform companies from preferencing their own products and services over those of rival businesses and from excluding or discriminating against rivals. Thursday's letter said this proposal would "promote innovation and competition" by preventing the platforms from protecting their monopolies. The right-leaning think tank American Enterprise Institute and others have argued that the bill could prevent Apple from pre-installing certain apps on its mobile phones, since that would advantage it over competing app developers. It could also prevent Google from integrating maps or customer reviews into search results, among other things. "At a minimum, the act would significantly disrupt these platforms' business models in ways that undermine consumer value," Daniel Lyons, a senior fellow for the group wrote in a blog post in June. Platform Competition and Opportunity Act The Platform Competition and Opportunity Act is aimed at preventing platform companies from acquiring potential or nascent competitors and its supporters argued in Thursday's letter that it would prevent the tech giants from enhancing or maintaining their market power. The bill would presumably have blocked Facebook's purchases of WhatsApp, Instagram and other services it has acquired, as well as a slew of deals by Google over the past two decades. Detractors have contended that this bill would limit investments in startups because it restricts their ability to be acquired by the larger technology firms, which they say is a key way for founders to benefit from their success. An American Enterprise Institute blog post from June argues that "opportunities for acquisition have been important drivers of innovation in tech" and also said the bill would prevent the tech companies from entering new areas of business to compete with each other. ACCESS Act The Augmenting Compatibility and Competition by Enabling Service Switching, or ACCESS Act, imposes requirements for the tech companies to make user data portable and able to be used by competing services. The bill's supporters argued in Thursday's letter that this prevents the tech giants from locking users into their services, since users can take their data with them and use it on other networks. Privacy and security implications have been flagged as potential problems for the proposal, with the Competitive Enterprise Institute saying in a statement in June that it's an "anti-privacy bill" that forces companies to turn over private user information to others. The group also said the bill would try to micromanage "complex, dynamic, and highly competitive markets" that are beyond understanding for most politicians and regulators. The American Enterprise Institute has also contended that the requirements would actually make rivals even more dependent on the incumbent platforms. Filing fees and state enforcement Of the antitrust bills approved by the House Judiciary Committee, the ones with the most bipartisan support appear to be the Merger Filing Fee Modernization Act and the State Antitrust Enforcement Venue Act, though it took a day of debate before the committee passed them. A Senate version of the filing fee bill passed that chamber in June as part of the U.S. Innovation and Competition Act. It would raise the fees merging parties pay when reporting large transactions, while lowering fees for smaller deals, in order to raise more resources for the antitrust agencies. Information Technology & Innovation Foundation argued in an August blog post that the legislation does not give Congress enough oversight over how the agencies will use the funds that it raises and called for the bill to include provisions requiring the money be used to hire more staff dedicated to antitrust enforcement. The Competitive Enterprise Institute also raised concerns about congressional oversight and contended that the bill would increase the cost of doing business at a time when the economy is sputtering. "U.S. consumers need innovative services and affordable products, not higher prices passed onto them by businesses avoiding new, unnecessary regulatory compliance costs," the group said in a June blog post. The state enforcement bill would prevent antitrust cases brought by state attorneys general from being transferred to a different venue by the Judicial Panel on Multidistrict Litigation, similar to protections afforded to federal enforcers. The bill is intended to prevent companies targeted by state-led enforcement actions from trying to move the cases to more favorable venues, and it also has an analog in the Senate. Information Technology & Innovation Foundation acknowledged in their August post that having cases included in multidistrict litigation can handicap state enforcers, but contended the changes should only apply to criminal matters and that the current version is wrong to block transfers of civil cases too. Thursday's letter from supporters of the bills said the proposals were carefully crafted to address the abusive practices of Big Tech, informed by the House antitrust subcommitee's sprawling investigation and "historic" 450-page report. "We believe that these bills will bring urgently needed change and accountability to these companies and an industry that most Americans agree is already doing great harm to our democracy," the letter said.

#### Aff requires negotiations that saps PC.

Pooley 21 [James; Former deputy director general of the United Nations’ World Intellectual Property Organization and a member of the Center for Intellectual Property Understanding; “Drawn-Out Negotiations Over Covid IP Will Blow Back on Biden,” Barron’s; 5/26/21; <https://www.barrons.com/articles/drawn-out-negotiations-over-covid-ip-will-blow-back-on-biden-51621973675>] Justin

The Biden administration recently announced its support for a proposal before the World Trade Organization that would suspend the intellectual property protections on Covid-19 vaccines as guaranteed by the landmark TRIPS Agreement, a global trade pact that took effect in 1995.

The decision has sparked furious debate, with supporters arguing that the decision will speed the vaccine rollout in developing countries. The reality, however, is that even if enacted, the IP waiver will have zero short-term impact—but could inflict serious, long-term harm on global economic growth. The myopic nature of the Biden administration’s announcement cannot be overstated.

Even if WTO officials decide to waive IP protections at their June meeting, it’ll simply kickstart months of legal negotiations over precisely which drug formulas and technical know-how are undeserving of IP protections. And it’s unthinkable that the Biden administration, or Congress for that matter, would actually force American companies to hand over their most cutting-edge—and closely guarded—secrets.

As a result, the inevitable foot-dragging will cause enormous resentment in developing countries. And that’s the real threat of the waiver—precisely because it won’t accomplish either of its short-term goals of improving vaccine access and facilitating tech transfers from rich countries to developing ones. It’ll strengthen calls for more extreme, anti-IP measures down the road.

Experts overwhelmingly agree that waiving IP protections alone won’t increase vaccine production. That’s because making a shot is far more complicated than just following a recipe, and two of the most effective vaccines are based on cutting-edge discoveries using messenger RNA.

As Moderna Chief Executive Stephane Bancel said on a recent earnings call, “This is a new technology. You cannot go hire people who know how to make the mRNA. Those people don’t exist. And then even if all those things were available, whoever wants to do mRNA vaccines will have to, you know, buy the machine, invent the manufacturing process, invent creation processes and ethical processes, and then they will have to go run a clinical trial, get the data, get the product approved and scale manufacturing. This doesn’t happen in six or 12 or 18 months.”

Anthony Fauci, the president’s chief medical adviser, has echoed that sentiment and emphasized the need for immediate solutions. “Going back and forth, consuming time and lawyers in a legal argument about waivers—that is not the endgame,” he said. “People are dying around the world and we have to get vaccines into their arms in the fastest and most efficient way possible.”

Those claiming the waiver poses an immediate, rather than long-term, threat to IP rights also misunderstand what the waiver will—and won’t—do.

The waiver petition itself is more akin to a statement of principle than an actual legal document. In fact, it’s only a few pages long.

As the Office of the United States Trade Representative has said, “Text-based negotiations at the WTO will take time given the consensus-based nature of the institution and the complexity of the issues involved.” The WTO director-general predicts negotiations will last until early December.

That’s a lot of wasted time and effort. The U.S. Trade Representative would be far better off spending the next six months breaking down real trade barriers and helping export our surplus vaccine doses and vaccine ingredients to countries in need.

#### Antitrust is key to the DIB – brink is now.

Sitaraman 20 [Ganesh; Vanderbilt University Law School; “The National Security Case for Breaking Up Big Tech,” Knight First Amendment Institute at Columbia; 3/12/20; <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3537870>] brett // Re-Cut Justin

Concentration in the tech sector also threatens the defense industrial base due to higher costs, lower quality, less innovation, and even corruption and fraud.71 Each of these dynamics has already been a problem for America’s over-consolidated defense industrial base. As technology becomes more and more central to defense and national security, it is likely that these same dynamics will replicate themselves with big tech companies. This will become a national security threat, both directly, in terms of the quality and speed of procurement, and indirectly, by reducing innovation and functionally redirecting defense budgets from research spending to higher monopoly profits.72 Conventional economic theory suggests that monopolists have the ability to increase prices and reduce quality because consumers are captive.73 When it comes to defense spending, the Government Accountability Office commented in 2019 that “competition is the cornerstone of a sound acquisition process and a critical tool for achieving the best return on investment for taxpayers.”74 At the same time, the GAO observed that “portfolio-wide cost growth has occurred in an environment where awards are often made without full and open competition.”75 Indeed, it found that 67 percent of 183 major weapons systems contracts had no competition and almost half of contracts went to a handful of firms. Of course, consolidation also means that the Defense Department is in a symbiotic relationship with these big contractors. Some startup executives wanting to sell to the government thus see the Pentagon as “a bad customer, one that is heavily skewed in favor of larger, traditional players,” and they don’t feel like they can break into the sector.76 Standard stories about political economy and capture also suggest that these firms will have outsized power over government.77 As Frank Kendall, the former head of acquisitions at the Pentagon, has said, “With size comes power, and the department’s experience with large defense contractors is that they are not hesitant to use this power for corporate advantage.”78 In the defense context, that means monopolists retain power (and profits), even if they overcharge taxpayers and risk the safety of military personnel in the field. In an important article in The American Conservative on concentration in the defense sector, researchers Matt Stoller and Lucas Kunce argue that contractors with de facto monopoly at the heart of their business models threaten national security. They write that one such contractor, TransDigm, buys up companies that supply the government with rare but essential airline parts and then hike up the prices, effectively holding the government “hostage.”79 They also point to L3, a defense contractor that had ambitions to be a “Home Depot” for the Pentagon, as its former CEO put it. L3’s de facto monopoly over certain products, according to Stoller and Kunce, means that it continues to receive lucrative government contracts, even after admitting in 2015 that it knowingly supplied defective weapons sights to U.S. forces.80 Consolidation also threatens U.S. defense capacity. The decline of competition, according to a 2019 Pentagon report, leaves the military vulnerable to “sole source suppliers, capacity shortfalls, a lack of competition, a lack of workforce skills, and unstable demand.”81 With a limited number of producers, there is less talent and knowhow available in the country if there is a need to build capacity rapidly.82 In 2018, the Defense Department released a report on vulnerable items in the military supply chain, including numerous items in which only one or two domestic companies (and, in some cases, zero domestic companies) produced the essential goods.83 How did the United States lose so much of its industrial base? The combination of consolidation and global integration is part of the story. As Stoller and Kunce argue, companies consolidated in the 1980s and 1990s while shifting emphasis from production and R&D to Wall Street-demanded profits. Globalization then allowed them to shift production overseas at a lower cost. The result was to gut America’s domestic industrial base—and, in many cases, to shift it to China, which engaged in a decades-long strategic plan to develop its own industrial base. The result, in the words of the 2018 Defense Department report, is that “China is the single or sole supplier for a number of specialty chemicals used in munitions and missiles.” In other areas too, the risks of losing access to critical resources are real. Describing the problem of limited carbon fiber sources, the same Pentagon report notes, “[a] sudden and catastrophic loss of supply would disrupt DoD missile, satellite, space launch, and other defense manufacturing programs. In many cases, there are no substitutes readily available.”84 As technology becomes more integral to the future of national security, it is hard to see how big tech will not simply go the way of the big defense contractors. Corporate mottos not to “be evil” are long gone,85 and big tech companies spend millions on conventional Washington, D.C., lobbying efforts.86 Over time, as contracts move to tech behemoths, there will no longer be competitive alternatives, and the Pentagon will likely be locked into relationships with big tech companies—just as they currently are with big defense contractors.87 Some commentators suggest that robust antitrust policies are a problem because only a small number of tech companies can contract for defense projects.88 But there is another way to look at it: The goal should be to encourage competition in the tech sector so that there are multiple contractors available. As former secretary of homeland security Michael Chertoff has said, defending the antitrust case against Qualcomm, “a single-source national champion creates an unacceptable risk to American security—artificially concentrating vulnerability in a single point. ... We need competition and multiple providers, not a potentially vulnerable technological monoculture.”89 The consequence of consolidation in tech is that taxpayers will likely see higher bills even as innovation slows due to reduced competition. Worse still, every taxpayer dollar that goes to monopoly profits—whether in the form of higher prices or fraud and corruption—is a dollar that is not going toward innovation for the future. A concentrated defense sector means not only less innovation due to the lack of competition in the sector; it means that funding that could have been available for innovation instead gets redirected via monopoly profits to the pockets of big tech executives and shareholders.

#### That solves extinction through great power war.

Marks 19 [Michael; Former Senior Policy Advisor to the Under Secretary for Security Assistance, Science and Technology at the U.S. Department of State; "Strengthen US Industry To Counter National Security Challenges," American Military News; 10/10/19; <https://americanmilitarynews.com/2019/10/strengthen-us-industry-to-counter-national-security-challenges/>] Justin

While U.S. defense budgets have recently been on the rise, it is likely that we will see a spending decline in the coming years as competition for non-defense federal budget dollars increases and deficits grow. The United States, therefore, must take action to ensure that we maintain our technological edge against our adversaries by empowering the private sector to provide cost-effective innovation for America’s defense. Since the end of the Second World War the U.S. has relied on qualitative superiority over its potential adversaries, especially those like the Soviet Union/Russia and China, who enjoyed comparative quantitative advantages. These qualitative advantages were vital to maintaining global stability and helped enable our nation to become the preeminent global economy, but they have been eroded over the last few decades. In 1960, the U.S. share of global research and development (R&D) spending stood at 69%. U.S. defense-related R&D alone accounted for 36% of total global expenditures. Soon thereafter other nations recognized the need to increase their R&D expenditures and build their own defense industrial bases to compete with the United States. From 2000-2016, China’s share of global R&D rose from 4.9% to 25.1% while the U.S. share of global R&D dropped to 28%. U.S. defense-related R&D meanwhile now makes up a mere 4% of global R&D spending. There can be no doubt that Russia and China are determined to challenge America’s qualitative advantage. From the rebirth of Russian military power under Vladimir Putin to the ever-growing Chinese military prowess across the board, their efforts show no sign of slowing down. Russia has been and continues to undergo a major modernization of its armed forces. For example, they are in the midst of a ten-year program to build hundreds of new nuclear missiles and have set a goal of modernizing 70% of the Russian Ground Force’s equipment by 2020. One of the most frightening examples of Russia’s resurgence is its development of a hypersonic missile that could be ready for combat as early as 2020. Worryingly, the US is currently unable to defend against this type of missile. To accompany these developments came the emergence in 2017 of Russia as the world’s second-largest arms producer, ready and able to support nations hostile to US interests. China, on the other hand, used to be a country that only manufactured cheap products and knockoffs, but that is no longer true. Technology development and innovation figure prominently in all of China’s national planning goals, with plans to make the country the global leader in science and innovation and the preeminent technological and manufacturing power by 2049, the 100th anniversary of the Chinese communist revolution. This, of course, has huge implications for China’s military capability. The country now has the second-largest national defense budget behind the U.S. and wants to be Asia’s preeminent military power. Beijing is developing next-generation fighter jets, ICBMs and shorter-range ballistic missiles, as well as advanced naval vessels. The People’s Liberation Army has reached a critical point of confidence and now feel they can match competitors like the United States in combat. This has implications for the security of Taiwan, Japan, other US allies in the region as well as to America itself. To make matters worse, there are a growing number of experts that see China developing asymmetric technologies, combined with conventional and nuclear systems that could create an existential threat to the U.S. pacific based assets. It is in the wake of these growing threats to our national security American industry will likely be expected to shoulder an even larger responsibility concerning investment in defense-related R&D. One of the ways we can empower companies to make these additional investments and lead next-generation defense innovation is to allow commonsense mergers between important defense and aerospace companies. Horizontal consolidation eliminates the redundancy of enormous fixed costs, leading to savings passed down to customers. Mergers can also create economies of scale and existing synergies that help the combined company realize access to larger numbers of engineers and innovators, while keeping costs low and improving the timeline for taking a product from concept to development. FA recent example of how this can work is the proposed Raytheon and United Technologies merger. The two parties project that the new combined company will employ more than 60,000 engineers, hold over 38,000 patents and invest approximately $8 billion per year in research and development. This will allow the development of new, critical technologies more quickly and efficiently than either company could on its own. Such private sector investments in innovation will be critical in the face of the growing challenges to American military dominance. America’s R&D advantage, crucial to maintaining military superiority, is increasingly at risk. As China and Russia continue to challenge America’s military dominance and pressures on the defense budget continue to mount, the federal government will likely turn more and more to contractors and commercial companies to develop next-generation defense capabilities. Strengthening U.S. industry, therefore, will be critical to countering our national security challenges.

## Case

### U/V

#### 1AR theory is skewed towards the aff – a) the 2NR must cover substance and over-cover theory, since they get the collapse and persuasive spin advantage of the 3min 2AR, b) their responses to my counter interp will be new, which means 1AR theory necessitates intervention. Implications – a) reject 1AR theory since it can’t be a legitimate check for abuse, b) drop the arg to minimize the chance the round is decided unfairly, c) use reasonability with a bar of defense or the aff always wins since the 2AR can line by line the whole 2NR without winning real abuse

lbl

### FW

### Adv

#### Contagious cancer is nonsense

Fessenden 13 (Marissa Fessenden, [], 3-18-2013, “Is Cancer Contagious? Could Hugo Chávez Have Been Deliberately Infected?“, Scientific American, accessed: 9-5-2021, https://www.scientificamerican.com/article/is-cancer-contagious/) ajs

The theory that someone could be infected with cancer is not biologically impossible, but it is unlikely. A healthy [immune system](https://blogs.scientificamerican.com/observations/tag/immune-system/) will combat any foreign cells, including cancerous ones. Only three types of contagious cancers have been identified, and all occur in non-primates.

Scientific American spoke with [Katherine Belov](http://sydney.edu.au/vetscience/about/staff/profiles/kathy.belov.php), professor of comparative genomics at the University of Sydney who studies a contagious cancer called [Tasmanian devil facial tumor disease](https://www.scientificamerican.com/article.cfm?id=the-devils-cancer). She explains why contagious cancers are rare and whether cancer could infect another person.

[An edited transcript of the interview follows.]

What are contagious cancers?  
In humans, we know that you can catch viruses, like the human papillomavirus, which make you more likely to get cancer. [[HPV can cause](https://www.scientificamerican.com/article.cfm?id=boys-should-get-hpv-vacci) cervical cancer in women, and genital warts and anal cancer in men.] In humans, environmental causes play an important role, too—cigarette smoke and radiation exposure can cause cancer. However, we don't have any clear examples of [naturally occurring] transmissible cancers in humans.

There is a transmissible cancer in dogs. It’s a sexually transmitted disease called canine transmissible venereal tumor, or CTVT. And there is also the Tasmanian devil facial tumor disease, which I work on. The devil’s cancer causes large ulcerations in their mouth and around their jaw. When they fight—and they fight a lot—they are biting other animals, and the cancerous cells are implanting in other animals’ wounds.

In both the Tasmanian devils and in the case of CTVT, the tumor evolved in really inbred populations of animals. There was a lack of diversity and so the cancer is genetically very similar to the animals it passes to.

Why does lack of diversity help the cancer jump from animal to animal?  
The cancer is transmitted to animals that are genetically similar to one another and also to the tumor. The immune system doesn't "see" it and doesn't mount an immune response. The cancer can then grow until it kills the animal.

Over time the devil’s facial tumor disease would have encountered animals that were genetically dissimilar to it. But the cancer found a way to down-regulate [or produce fewer] cell-surface molecules, which are sort of red flags to the immune system in genetically different animals. These flags are part of the major histocompatibility complex [a set of molecules attached to cells that regulate interactions with immune cells]—they are MHC molecules. Without those special immune molecules the cancer is able to fly under the radar of the immune system and pass from animal to animal.

So the immune system doesn’t just identify viruses and bacteria—it also keeps watch for any types of foreign cells?  
And even cells from your own body that are dangerous. Cancers are just from a mutation in a cell. Our immune system is patrolling and looking for those cancerous cells. If our immune system sees a cell is cancerous, it will kill it. So cancers arise often, but we don't really know about them.

Sign up for Scientific American’s free newsletters.

[Sign Up](https://www.scientificamerican.com/page/newsletter-sign-up/?origincode=2018_sciam_ArticlePromo_NewsletterSignUp)

Why hasn’t contagious cancer evolved in humans?  
One of the key reasons is our genetic diversity. In a population where there is a lot of genetic diversity, we all have very different versions of the flags I’m talking about. So if a cell gets into us and has a different combination of flags, our immune system will kill it.

And that's why, if you need organ transplantation, you go to close family members. They are more likely to share the same flags as you do, [making it more likely for the transplanted organ to be tolerated by your immune system]. Still, there will be some variation in the combination of these cell surface flags that they have, which is why usually recipients of organ transplantation are given immunosuppressant drugs.

#### No disease extinction

Owen Cotton-Barratt 17, et al, PhD in Pure Mathematics, Oxford, Lecturer in Mathematics at Oxford, Research Associate at the Future of Humanity Institute, 2/3/2017, Existential Risk: Diplomacy and Governance, https://www.fhi.ox.ac.uk/wp-content/uploads/Existential-Risks-2017-01-23.pdf

For most of human history, natural pandemics have posed the greatest risk of mass global fatalities.37 However, there are some reasons to believe that natural pandemics are very unlikely to cause human extinction. Analysis of the International Union for Conservation of Nature (IUCN) red list database has shown that of the 833 recorded plant and animal species extinctions known to have occurred since 1500, less than 4% (31 species) were ascribed to infectious disease.38 None of the mammals and amphibians on this list were globally dispersed, and other factors aside from infectious disease also contributed to their extinction. It therefore seems that our own species, which is very numerous, globally dispersed, and capable of a rational response to problems, is very unlikely to be killed off by a natural pandemic.

One underlying explanation for this is that highly lethal pathogens can kill their hosts before they have a chance to spread, so there is a selective pressure for pathogens not to be highly lethal. Therefore, pathogens are likely to co-evolve with their hosts rather than kill all possible hosts.39

#### Squo solves superbugs, and it doesn’t require more innovation

Sprenger 17 (Marc Sprenger, [WHO Director, Antimicrobial Resistance Secretariat, ], 5-29-2017, “Superbugs: The world is taking action, but low-income countries must not be left behind“, No Publication, accessed: 9-5-2021, https://www.who.int/news-room/commentaries/detail/superbugs-the-world-is-taking-action-but-low-income-countries-must-not-be-left-behind) ajs

Now, antimicrobial resistance has finally come to the forefront in health and political circles, leading to the development in 2015 of a Global Action Plan, endorsed by Ministers of Health and Agriculture at the governing bodies of WHO, FAO and OIE, and Heads of State at a high-level meeting of the UN General Assembly last September. Since then, countries have been developing national action plans to put the globally-agreed policy changes into practice.

Our survey of country progress offers some good news. More than 90% of people in the world (6.5 billion) live in a country that has developed, or is developing, a national action plan on antimicrobial resistance. Some of the key areas in which countries report that they are doing well are: training doctors, nurses, and other health workers on how to reduce the spread of antimicrobial resistance; improving the prevention and control of infections; and strengthening systems to detect the extent of the problem. These are incredible achievements. National plans are multisectoral—which means that leaders in human health, animal health, and the environment, who often talk about joined-up approaches, are actually putting it into action.

When you drill down into the numbers, a slightly less rosy picture emerges. High-income countries that already have stronger health and agricultural systems are much better prepared to deal with antimicrobial resistance—more than 80% of these countries have a plan in place, or are developing one. By contrast, about 30% of low-income countries either have or are developing a plan. This is not surprising. Many low-income countries lack the expertise or capacity to develop a national plan, or they are overwhelmed by dealing with fragile health systems or outbreaks of infectious diseases.

Yet low-income countries are the ones that need to be the best prepared since they are likely to bear the brunt of resistance: infectious diseases are much more common, and their health systems are much weaker and less able to adapt as first-line antibiotics (which tend to be cheaper) become less effective. The burden of harder-to-treat infectious diseases and the impact of treatment failure in human lives and relative economic cost will be much higher than in richer countries.

The lack of preparedness in low-income countries should concern us all, no matter how rich a country we live in. Antibiotic resistance will not just affect the ability to treat diseases such as malaria or tuberculosis, which many might think occur in the poorest parts of the world. Resistant bacteria will challenge our ability to treat women in childbirth, people undergoing surgery, or those on cancer chemotherapy. And, in a globalized world, microbes don’t respect national borders. They spread with ease.

So how can we support all countries to be better prepared? WHO is providing training and support to several countries, but my hope is that other development partners will engage to support implementation in low-income countries. There are many more immediate and visible problems in these countries, but not addressing antimicrobial resistance straight away, threatens the sustainability of recent progress in fragile health systems and creates a global risk.

The survey shows, perhaps not surprisingly, that strengthening the health response will be challenging, but an even greater challenge will be to build resilient systems in other sectors. Antimicrobial resistance is not just a health issue—it is a development issue. We need to engage with the development community to strengthen health, agricultural and environmental systems. National governments, development agencies and banks need to invest in national action plans now to prevent the greater impact on health, economic development and livestock production.

The good news is that we know how to reduce antimicrobial resistance. We need to reduce the need for antimicrobials through good clinical practice, immunization, improvements in water, sanitation and hygiene, and good animal husbandry; we also need to ensure that these medicines are used more prudently in both people and animals, through better diagnostics, better access to the right drugs, and better regulation of antibiotics. We also need a much better system for monitoring supplies of drugs, where they are shipped, how they are distributed, and monitoring and reporting of the prevalence of drug-resistant infections in humans and animals.

This is a complex puzzle, but one that we can solve. It is one that, for the sake of the world’s health and wealth, we must solve.

#### Adaptation checks extinction from warming but CO2 prevents famine, collapse of ag, and ice age- those are coming now

Moore 16 (Dr. Patrick Moore is a Senior Fellow with the Energy, Ecology and Prosperity program at the Frontier Centre for Public Policy. He has been a leader in the international environmental field for over 40 years. Dr. Moore is a Co-Founder of Greenpeace and served for nine years as President of Greenpeace Canada and seven years as a Director of Greenpeace International. Following his time with Greenpeace, Dr. Moore joined the Forest Alliance of BC where he worked for ten years to develop the Principles of Sustainable Forestry, which have now been adopted by much of the industry. In 2013, he published Confessions of a Greenpeace Dropout – The Making of a Sensible Environmentalist, which documents his 15 years with Greenpeace and outlines his vision for a sustainable future. THE POSITIVE IMPACT OF HUMAN CO2 EMISSIONS ON THE SURVIVAL OF LIFE ON EARTH, June 2016, <https://fcpp.org/sites/default/files/documents/Moore%20-%20Positive%20Impact%20of%20Human%20CO2%20Emissions.pdf>)

CO2 in the Modern Era The most important question facing a species on Earth today is how long would it have been in the absence of human-caused CO2 emissions until the gradual depletion of CO2 in the atmosphere fell to levels that began to decrease biomass due to starvation, thus signaling the beginning of the end of life on Earth? It is commonly believed that volcanic activity results in massive emissions of CO2 comparable to or greater than human-caused emissions. This is not the case. Whereas the original atmospheric CO2 was the result of massive outgassing from the Earth’s interior, there is no evidence that large volumes of new CO2 were added to the atmosphere during the 140-million-year decline leading to the present era. The eruption of Mount Pinatubo, the largest in recent history, is estimated to have released the equivalent of 2 per cent of the annual human-caused CO2 emissions. Therefore, in the absence of human-caused emissions, it could reasonably be presumed that CO2 levels would have continued to fall as they had done for the previous 140 million years.20 Judging by the timing of the many glacial and interglacial periods during the Pleistocene Ice Age, the next major glaciation period could begin any time. Interglacial periods have generally been of 10,000 years’ duration, and this Holocene interglacial period began nearly 12,000 years ago. In the absence of human-caused CO2 emissions and other environmental impacts, there is no reason to doubt that another major glaciation would have occurred, following the pattern that has been established for at least the past 800,000 years, as established by the European Project for Ice Coring in Antarctica (EPICA),21 and presumably for the past 2.5 million years of the Pletstocene Ice Age. These glaciations have coincided with the Milankovitch cycles.22 (See Figure 5) The Milankovitch cycles are determined by oscillations in the Earth’s orbit and by cycles of the tilt of the Earth toward the sun. The strong correlation between the onset of major periods of glaciation during the past 800,000 years and the Milankovitch cycles has led the majority of earth scientists and climatologists to accept the hypothesis that the major glaciations are tied to the Milankovitch cycles in a causeeffect relationship. For 90 million years from the late Jurassic Period to the Early Tertiary Period, global temperature rose considerably while CO2 levels steadily declined. Then after the Paleocene-Eocene Thermal Maximum, there began a 50-million-year cooling trend in global temperature to the current era. (See Figure 6) The Paleocene-Eocene Thermal Maximum saw an average global temperature [13] FRONTIER CENTRE FOR PUBLIC POLICY as much as 16°C higher than the temperature today. Yet, the ancestors of every species living today must have survived through this period, as they had also survived through previous much colder climates. It is instructive to note that despite the numerous periods of extreme climatic conditions and cataclysmic events, every species alive today is descended from species that survived those conditions. This leads one to question the predictions of mass species extinction and the collapse of human civilization if the average global temperature exceeds a rise of 2°C above today’s level.25 It may seem surprising that the average global temperature could have been 16°C higher in previous ages, as this Figure 5. Graph showing the atmospheric CO2 concentration and temperature from Antarctica for the most recent four interglacial periods, closely tied to the Milankovitch cycles of 100,000 years. This graph is based on data from the 420,000 year record obtained from the Vostok ice cores drilled by Russian scientists.23 Note the gradual nature of the onset of colder temperatures and the rapid warming at the end of the cycle. Note that the peak warming during the most recent interglacial period (the Holocene) is lower than during the previous three interglacial periods.24 Figure 6. Global surface temperature from 65 million YBP showing the major cooling trend over the past 50 million years. While the poles were considerably warmer than they are today, there was much less warming in the tropics, which remained habitable throughout. The Earth is in one of the coldest periods during the past 600 million years.26 [14] FRONTIER CENTRE FOR PUBLIC POLICY would appear to render parts of the Earth that are warm today virtually uninhabitable. The key to understanding this is that when the Earth warms, it does so disproportionally, depending on the latitude. While the Arctic and Antarctic experience considerable warming, there is much less warming in the tropics. Thus, the tropical regions remain habitable while the high latitudes shift from polar to temperate, and during the warmest ages, they shift to a tropical climate. It is clear from the 800,000-year Antarctic ice core record that the coldest periods during major glaciations coincide with the lowest levels of CO2 in the atmosphere. (see Figure 5) The correlation is certainly strong enough during this period to suggest a causal relationship between CO2 and temperature. However, there is disagreement in the literature about which is the cause and which is the effect. Those who ascribe the warming over the past century to greenhouse gas emissions, CO2 in particular, also tend to agree with the position set forth in Al Gore’s An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do about It, that the warming during the interglacial periods is caused by rising CO2 levels.27 However, it is problematic to postulate how the Milankovitch cycles could cause an increase or decrease in atmospheric CO2 levels, whereas it is plausible that the Milankovitch cycles could cause a fluctuation in global temperature due to changes in solar radiation, which in turn could cause either CO2 outgassing from or absorption into the oceans. Indeed, both sets of ice core data from Antarctica show that changes in temperature usually precede changes in CO2 levels, suggesting that temperature change is the cause of change in the level of CO2. 28 Some have suggested that although the onset of warming after a glaciation is caused by the Milankovitch cycles, the subsequent outgassing of CO2 from the ocean then becomes the predominant driver of further warming.29 Presumably, it would also be postulated that the cooling leading to glaciation is triggered by the Milankovitch cycle and then driven by reduced CO2 levels due to ocean absorption. This hypothesis is not proven. It is extremely unlikely or perhaps impossible to imagine how CO2 could have increased from a pre-industrial 280 ppm to 400 ppm in the absence of human-caused emissions. No other species, existing or imagined in the near future, is capable of digging and drilling into the massive deposits of fossil fuels and then burning them so as to release CO2 back into the atmosphere from where it had come in the first place. Many scientists think this increase in atmospheric CO2 is the dominant cause of the slight warming (0.5C) of the atmosphere over the past 65 years. Only time will tell if this is the case. Since the Little Ice Age peaked around 1700, the climate has been warming in fits and starts for about 300 years. It is possible that the most recent warming is a continuation of the longer period of warming that had already begun long before human-caused CO2 emissions could have been a factor. [15] FRONTIER CENTRE FOR PUBLIC POLICY HIGHER CO2 CONCENTRATIONS WILL INCREASE PLANT GROWTH AND BIOMASS It has been well demonstrated that the increase in CO2 in the atmosphere is responsible for increased plant growth on a global scale. Many studies suggest that nearly 25 per cent of human-caused CO2 emissions, or 2.5 Gt of carbon annually, are absorbed by plants, thus increasing global plant biomass. A recent study postulates that up to 50 per cent of human CO2 emissions are absorbed by increased plant growth.30 This has been described as a “greening of the Earth” as CO2 reaches concentrations well above the near-starvation levels experienced during the major glaciations of the Pleistocene.31 The most prestigious Australian science body, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), has shown that CO2 particularly benefits plants that are adapted to dry climates. In higher CO2 environments, they become more efficient at photosynthesis, growing faster without using more water.32 One of the most impressive records comes from an experimental forest in Germany where there is a continuous Figure 8. Change in net primary productivity of vegetation 1982 to 2010. The driest regions, such as Western Australia, sub-Saharan Africa, western India and the Great Plains of North America, show the greatest increase in plant growth.36 Figure 7. Craig Idso,expert on CO2 and author of the CO2Science website34 demonstrating the growth-rate of pine trees under ambient conditions versus the addition of 150 ppm, 300 ppm and 450 ppm CO2. In a higher CO2 world there will be a great increase in the growth of food crops, forests, and wild landscapes around the world. Studies also demonstrate that higher CO2 levels in the oceans will result in increased growth of phytoplankton and other marine plants.35 [16] FRONTIER CENTRE FOR PUBLIC POLICY record of forest growth since 1870. Since 1960, as CO2 emissions began to rise rapidly, the growth rate of individual trees has increased by 32 per cent to 77 per cent. While some of this may be due to the slight increase in temperature since 1960, the much higher growth rate is consistent with laboratory and field studies on the effect of increased CO2 levels on plants.33 It is not widely known that greenhouse operators worldwide inject additional CO2 into their greenhouses in order to increase the growth and yield of their crops. Among horticulturalists, it is well known that this practice can increase growth by 40 per cent or more. This is because the optimum level of CO2 for plant growth is between 1,000 ppm and 3,000 ppm in air, much higher than the 400 ppm in the global atmosphere today.37 Every species on Earth, including our own, is descended from ancestors that thrived in climates with much higher levels of CO2 than are present today. Discussion The debate about climate change has one side insisting that the “science is settled.” Yet, there is no scientific proof that increased CO2 will result in disaster, as CO2 has been higher during most of the history of life on Earth than it is today. On the other hand, it can be stated without a doubt that if CO2 once again falls to the level it was only 18,000 years ago, or lower, there would be a catastrophe unlike any known in human history. We are advised by many scientists that we should be worried about CO2 levels climbing higher when, in fact, we should actually be worried about CO2 levels sinking lower. Atmospheric CO2 Concentrations in the Future If humans had not begun to use fossil fuels for energy, it is reasonable to assume that atmospheric CO2 concentration would have continued to drop as it has done for the past 140 million years. It is also reasonable to assume that the Earth’s climate would continue to fluctuate between relatively long periods of glaciation and relatively short periods of interglacial climate similar to the present climate. Given continued withdrawal of carbon from the atmosphere into the ocean sediments, it would only be a matter of time before CO2 dropped to 150 ppm or lower during a period of glaciation. At the average rate of 32 Kt of carbon lost annually, this would occur in less than two million years from now. In other words, the beginning of the end of most life on planet Earth would begin in fewer years into the future than our genus of primates, Homo, has existed as a distinct taxonomic unit. It is instructive to note that our species is a tropical species that evolved at the equator in ecosystems as warm or warmer than today’s. We were only able to leave the warmth of the tropical climate due to harnessing fire, wearing clothing and building shelters. This allowed us to settle in temperate climes and even Arctic conditions by the sea where domesticated dogs as well as marine mammals made life possible for a very small population. However, we cannot grow food crops in abundance on glaciers or in frozen soil. Moreover, we would not be able to grow much of anything anywhere if the level of CO2 went below 150 ppm. There is a distinct possibility that no amount of additional CO2 will shift the climate out of the next major period of glaciation. This is not a reason to abandon hope but rather to marvel at the fact that we can actually put some of the CO2 needed for life back into the atmosphere while at the same time enjoying abundant, reasonably priced energy from fossil fuels. There has been a gradual net loss of CO2 from the atmosphere during the past 550 million years from approximately 14,000 Gt to approximately 370 Gt at the lowest level during the height of the last glaciation. This is a reduction of nearly 98 per cent of one of the most essential nutrients for life on Earth. In the absence of human CO2 emissions over the past century, it is difficult to imagine how this process of continuous removal of CO2 would be interrupted. Massive volcanism on a scale not seen for more than 200 million years would be required to [17] FRONTIER CENTRE FOR PUBLIC POLICY bring about a reversal in the long-term CO2 trend that has now been achieved by human CO2 emissions. There is no doubt the Earth’s interior has cooled substantially over its roughly 4.6-billion-year existence. This makes massive volcanism an ever-decreasing likelihood. There is no other plausible natural mechanism to return carbon to the global atmosphere in the form of CO2. The present Holocene interglacial has already endured longer than some previous interglacial periods. The Holocene is also somewhat cooler than previous interglacial periods. Of more urgent concern than the possible starvation of life two million years from now is what would happen at the onset of the next glaciation, possibly a relatively short time from now. In the absence of human CO2 emissions, both temperature and CO2 would have dropped to levels that would result in a continuous reduction in plant growth, bringing in climatic conditions similar to or perhaps even more severe than those that occurred in previous glaciations. This would certainly lead to widespread famine and likely the eventual collapse of human civilization. This scenario would not require two million years but possibly only a few thousand. Even if the conditions of the Little Ice Age reoccurred in the next hundreds of years with a human population of nine billion or more, we can be sure the population would not be nine billion for long. There is a strong argument to be made that the Earth is already in a cooling trend that is descending into the next 100,000-year cycle of major glaciation. See Figure 5 and note that in the three preceding interglacial periods, there was a sharp peak followed by a steady downward trend in temperature. The peak temperature in this Holocene interglacial period was during the Holocene Optimum between 5,000 and 9,000 years ago. Since then, the warming peaks have been diminishing, and the cool periods have been colder. The Little Ice Age, which peaked about 300 years ago, was possibly the coldest period of climate since the Holocene Optimum.39 A Paradigm Shift in the Perception of CO2 Independent scientist James Lovelock provides an interesting example of both these contrasting predictions of future catastrophe versus salvation regarding CO2 Figure 9. Reconstructed Greenland mean temperature anomalies (top) and Antarctic CO2 concentration (bottom). Halving the temperature anomalies to allow for polar amplification gives a reasonable approximation of global temperature change in the Holocene. Since the Holocene Optimum began about 9,000 years before present (ka BP), global temperature has fallen by ~1°C, though CO2 concentration rose throughout.38 [18] FRONTIER CENTRE FOR PUBLIC POLICY emissions. He is undoubtedly one of the foremost experts in atmospheric chemistry,40 which is why NASA retained him to design part of the life-detection equipment for the first U.S. Mars landers.41 He concluded from the results that there is no life on Mars. Since publishing his first book on the Gaia hypothesis in 1979, Lovelock became concerned with human civilization’s impact on the global atmosphere.42 He became a strong advocate for reducing CO2 emissions, stating that humans had become a “rogue species” against Gaia (the Earth). He went so far as to state in 2006, ‘“Before this century is over, billions of us will die, and the few breeding pairs of people that survive will be in the Arctic where the climate remains tolerable . . . a broken rabble led by brutal warlords.”’43 Only four years later, in a public speech at London’s Science Museum in 2010, Lovelock recanted, stating, ‘It is worth thinking that what we are doing in creating all these carbon emissions, far from something frightful, is stopping the onset of a new ice age. If we hadn’t appeared on the earth, it would be due to go through another ice age and we can look at our part as holding that up. I hate all this business about feeling guilty about what we’re doing.’44 This abrupt reversal of Lovelock’s interpretation of CO2 is precisely what is required universally to avoid the tragedy of depriving billions of people of reasonably priced, reliable energy, especially those with a need to lift themselves out of poverty. There must be a total paradigm shift from demonizing fossil fuels and fearing CO2 as a toxic pollutant to celebrating CO2 as the giver of life that it is while continuing to use fossil fuels ever-more efficiently. Like Lovelock, we should be hopeful that CO2 will prove to be the moderate warming influence that it is predicted to be in theory. A somewhat warmer world with a higher level of CO2 in the atmosphere would result in a greener world with more plant biomass, higher yields of food crops and trees, a more hospitable climate in high northern latitudes and a possible reduction in the likelihood of another major glaciation. It is highly probable, and ironic, that the existence of life itself may have predetermined its own eventual demise due mainly to the development of CaCO3 as armour plating in marine organisms.45 The fact that humans appear able to reverse this fate temporarily due to our recycling of CO2 back into the atmosphere by burning fossil fuels for energy verges on the miraculous. Nevertheless, there is only so much fossil fuel, and once burned, it is not renewable in the short to medium term. The vast bulk of carbon is sequestered into carbonaceous rocks, mainly as CaCO3. Today, about 5 per cent of human CO2 emissions are derived from converting CaCO3 with heat into CO2 and CaO (lime) to manufacture cement. Therefore, when fossil fuels become scarce in future centuries, and if CO2 again begins to dwindle, we will have the option of producing additional CO2 by burning limestone with nuclear or solar energy, with lime for cement as a useful by-product. This has the potential to extend the existence of a highly productive living Earth into the far distant future. It is clear from the preceding discussion that rather than bringing on a catastrophic climate condition, human CO2 emissions are serving to reinstate a balance to the global carbon cycle. By reversing the 140-million-year decline in atmospheric CO2, we are helping to ensure the continuation of carbon-based life on Earth. [19] FRONTIER CENTRE FOR PUBLIC POLICY CONCLUSION CO2 is essential for life, and twice in the history of modern life there have been periods of steep decline in the concentration of CO2 in the global atmosphere. If this decline were to have continued at the same rate into the future, CO2 would eventually fall to levels insufficient to support plant life, possibly in less than two million years. More worrisome is the possibility in the nearer future that during a future glaciation, CO2 may fall to 180 ppm or lower, thus greatly reducing the growth of food crops and other plants. Human CO2 emissions have staved off this possibility so that at least during a period of glaciation, CO2 would be high enough to maintain a productive agricultural industry. A 140 million year decline in CO2 to levels that came close to threatening the survival of life on Earth can hardly be described as “the balance of nature”. To that extent human emissions are restoring a balance to the global carbon cycle by returning some of the CO2 back to the atmosphere that was drawn down by photosynthesis and CaCO3 production and subsequently lost to deep sediments. This extremely positive aspect of human CO2 emissions must surely be weighed against the unproven hypothesis that human CO2 emissions are mainly responsible for the slight warming of the climate in recent years and will cause catastrophic warming over the coming decades. The fact that the current warming began about 300 years ago during the Little Ice Age indicates that it may at least in part be the continuation of the same natural forces that have caused the climate to change through the ages.