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#### Innovation is high now

Kenan 6-9, The Frank Hawkins Kenan Institute of Private Enterprise develops and promotes innovative, market-based solutions to vital economic issues. With the belief that private enterprise is the cornerstone of a prosperous and free society, the institute fosters the entrepreneurial spirit to stimulate economic prosperity and improve the lives of people in North Carolina, across the country and around the world. Kenan Institute, 6-9-21, “Turbocharging Healthcare Innovation” <https://kenaninstitute.unc.edu/kenan-insight/turbocharging-healthcare-innovation/> brett

As COVID-19 began to spread around the globe, companies and entrepreneurs stepped up to develop new technologies and redeploy existing technologies in their portfolio to tackle the disease and cope with the constraints it brought. The pandemic forced telemedicine into the mainstream and brought mRNA vaccine technology to the forefront. At the same time, new technologies such as CRISPR gene editing and artificial intelligence (AI) approaches have been finding their niche for speeding up drug discovery and development. Healthcare innovation was already on the fast train before the pandemic. Now, it’s been turbocharged. In this Kenan Insight, we explore why the 2021 Trends in Entrepreneurship Report names emerging technology in the healthcare industry as a key trend for entrepreneurship, along with some of the challenges that come with fast-moving technology advances. A trajectory of explosive growth The healthcare industry has experienced extraordinary growth over the past four decades. Big pharma is driving much of this boom, accounting for 10% of the U.S. economy’s overall R&D spending at the end of 2020.1 The medical device industry, expected to generate $54.5 billion over the next four years, is another important player.2 This growth is catching the attention of investors. In 2020, health tech startups raised approximately $14 billion in venture capital funding, nearly double that of 2019.3 CB Insights estimates there are now 51 healthcare unicorns, defined as startups valued at $1 billion or more. Health-tech venture funding reached record levels in 2020

Source: Deloitte analysis of Rock Health’s Digital Health Funding Database Innovation is a critical driver in the healthcare sector. Increasing rates of innovation can be seen in the sharp rise of U.S. patents granted for pharmaceuticals and medical devices in recent years. Between 2013 and 2019, more than 60,000 pharmaceutical patents and more than 125,000 medical device patents were granted.4 Today, there are more than 18,500 drugs at various stages of the development process worldwide.5 Maturing technologies The increasing numbers of patent applications, clinical trials and collaborations are leading indicators of a vibrant and growing biopharmaceutical ecosystem. However, the proliferation of innovation tools, rather than just innovative products, is what will allow the next generation of pharmaceutical drugs to be discovered more quickly and more efficiently, to provide more effective treatments and to target diseases that have so far evaded our collective intervention efforts. As scientists learn more about human genes and their connection to diseases, these insights can feed into tools that make drug R&D faster, less expensive and more precise. AI technology has matured to the point where it can now be used reliably to analyze huge amounts of data and solve extremely complex problems. This has made AI attractive to the pharmaceutical industry as a tool that can enable more efficient identification of new drugs and drug targets. In 2020, drug discovery was the focus area that received the most private AI investment, with more than $13.8 billion invested globally. This was 4.5 times higher than the total for 2019.6 CRISPR gene editing is another hot technology that is enabling the development of more innovative and accurate therapeutic strategies. This tool is making it easier to determine the genes and proteins that cause or prevent disease and thus to identify new targets for potential drugs. As of the second quarter of 2020, there were 724 active companies around the world focused on using or developing CRISPR technology and almost 50 clinical trials involving CRISPR.7 mRNA was certainly one of the brightest technology stars of 2020. After decades of research, mRNA proved to be the ideal solution for developing a highly effective COVID-19 vaccine at record speed. However, this is likely only the beginning of the story for mRNA. Therapies based on mRNA technology are being developed to treat malaria, cancer and multiple sclerosis and we’ll likely see more mRNA-based vaccines designed to fight a host of current and future infectious diseases. As of February 2021, CB Insights reports more than 520 ongoing clinical trials worldwide that were applying mRNA technology to more than 20 disease classes.8

#### The plan undermines the economic certainty provided by TRIPS---that disrupts innovation in every sector

Lee & Christopher 5-10, Tom received a B.A. in Economics with a Statistics Minor from the University of Maryland, College Park, in 2018. Christopher has a Master’s in Congressional and Presidential Studies from The Catholic University of America, and he studied political science as an undergraduate at Whitman College. American Action Forum, May 10, 2021. “Intellectual Property, COVID-19 Vaccines, and the Proposed TRIPS Waiver” <https://www.americanactionforum.org/insight/intellectual-property-covid-19-vaccines-and-the-proposed-trips-waiver/> brett

Public posturing aside, the Biden Administration surely knows that a TRIPS waiver for COVID-19 related IP will likely be futile. Scaling up production, as Klain alluded to, has proven to be the main challenge to manufacturing larger quantities of vaccine.[4] Waiving TRIPS would do nothing to address this constraint. Waiving TRIPS would instead encourage IP abuse and distort market forces and innovation. TRIPS Provisions The TRIPS agreement is an international trade agreement among all 164 members of the WTO. It is one of three founding and central components of the WTO, along with the General Agreement on Tariffs and Trade (GATT) and the General Agreement on Trade in Services (GATS). The purpose of the TRIPS agreement is to unify trade and provide increased certainty in international economic relations. Among other things, TRIPS specifically: Provides minimum IP protections and standards that apply to all WTO members; Outlines enforcement actions that countries can undertake to remedy violations of the above standards; and Establishes dispute settlement procedures to allow countries to negotiate an end to disagreements. TRIPS does, however, allow for compulsory licensing where in a public health emergency, a country may copy patented drugs without the permission of the original manufacturer with WTO approval. Proposal to Waive TRIPS The recent proposal submitted by India and South Africa and signed on by over 100 developing countries would waive four specific protections of COVID-19 vaccines and related medical products and services: Copyrights; Patents; Trademarks; and Undisclosed information procedures. The first three protections allow companies to prevent foreign companies from copying their products. They require the original company to disclose information about the product, however. Foreign companies are free to study the disclosed information of the patent but cannot copy it unless given a licensing agreement from the original company. Contrarily, companies can choose not to get patents for their products and instead keep their information secret. The fourth protection prevents the theft of trade secrets of foreign companies. While TRIPS has been waived previously, if approved, this would be the broadest waiver since the agreement’s enactment in 1995.[5] TRIPS and Manufacturing Capacity The primary justification for waiving TRIPS is that IP protections cause underutilized manufacturing capacity. By removing TRIPS, developing nations could copy patented drugs and use their own manufacturers to produce vaccines, thereby increasing access. This rationale, however, is flawed. Adar Poonawalla, CEO of the Serum Institute of India—currently the largest producer of COVID-19 vaccine doses in the world—has argued that access to IP is not limiting vaccine production, rather it is the time involved in scaling up manufacturing capacity.[6] It should also be noted that Moderna has already pledged not to enforce its own COVID-19 vaccine patents during the pandemic.[7] In addition, COVID-19 vaccines such as those produced by Pfizer and Moderna use emerging and very complex technologies and processes. These technologies and processes are essential to producing and increasing scale of COVID-19 vaccines. They are not published in patents but rather kept as trade secrets. The fourth protection mentioned above only prevents theft of trade secrets; it does not allow or disallow a company from keeping trade secrets. Waiving TRIPS therefore does nothing to speed up vaccine production even if there were excess manufacturing capacity, as manufacturers would not receive the essential trade secrets they would need. The issue at present is not underutilized manufacturing capacity, rather scaling up production has been the largest difficulty of vaccine manufacturing. It takes anywhere from 60 to 120 days to produce a single batch of vaccines. Even with manufacturing challenges, between 9.5 and 13.5 billion doses of COVID-19 vaccines are projected to be produced in 2021. Eleven billion doses would be sufficient to vaccinate 70 percent of the world population and reach heard immunity, assuming 2-dose vaccinations.[8] TRIPS and Compulsory Licensing Separate from a broad IP waiver, TRIPS includes a compulsory licensing process. Foreign manufacturers are free to ask a patentee for a voluntary licensing agreement to manufacture a product. This process can be long, however, and the patentee can ultimately refuse. When this happens, TRIPS allows the manufacturer through its national government to grant a compulsory license provided the manufacturer has first sought a voluntary licensing agreement. This compulsory license is issued by that national government to the manufacturer to produce a patented drug without the original patentee’s permission. Each compulsory license must apply to a specific product. It is important to note that TRIPS does not have a governing body which oversees this process. At the same time, if a country grants an internationally unpopular compulsory license, it will face economic, political, and retaliatory ramifications from other governments and private firms, so governments must weigh these costs. In addition, if a country declares a national emergency or other circumstances of extreme urgency, TRIPS allows a foreign manufacturer to immediately apply for a compulsory license, skipping the process to apply for a voluntary license. A TRIPS waiver, like the one suggested for COVID-19-related IP, is therefore entirely unnecessary—even if IP protections were an obstacle to vaccine access. In the case of COVID-19, compulsory licensing would not, however, address the real issues related to scaling manufacturing capacity. The Vagueness of the Proposed TRIPS Waiver Under the broad language of the proposed TRIPS waiver, any drugs that have use for patients with COVID-19, including those that predate the pandemic, could lose patent protection. Thus, a foreign company could produce a specific drug under the auspices of COVID-19 but sell it for another disease. Moreover, the foreign company would not have to provide any financial compensation to the company from whom they took the IP. The proposal’s language is so broad that other patented medical products beyond pharmaceutical drugs such as masks, non-pharmaceutical chemical compounds, and respirators would also be subject to the waiver. It is also noteworthy that the vaccines developed by Pfizer, Moderna, and Johnson & Johnson are not currently approved by the Indian government for use in India, due to regulatory obstacles related to localized clinical trials. Effectively then, India is pointing to IP protections as an obstacle to obtaining vaccines they have not even approved for use in their country.[9] At the same time, a concerted global effort is underway to ensure access to COVID-19 vaccines in all countries. The WHO, Gavi (previously the Global Alliance for Vaccines and Immunization), and the Coalition for Epidemic Preparedness Innovations have partnered to establish the COVAX initiative, designed specifically to distribute vaccines to the developing world. COVAX is projected to distribute at least 2 billion vaccines by the end of 2021.[10] Johnson & Johnson has further announced plans to distribute 500 million vaccines to developing nations starting in mid-2021, in addition to those it already allocated to other nations.[11] TRIPS and Innovation The TRIPS agreement and its IP protections were created to increase unity and certainty in the global economy. The economic certainty provided by IP protections preserve competitiveness and increase value—i.e., IP protections provide incentives to companies to create new and groundbreaking technologies. In terms of the COVID-19 pandemic, perhaps it is these incentives that encouraged companies to produce vaccines quickly and successfully. Without IP protections, companies could not reap the rewards of their efforts. Waiving TRIPS would weaken the market forces that encourage innovation. Combined with the broad language of the TRIPS waiver, the loss of innovation would happen in many industries and sectors of the global economy. Conclusion The proposal to waive TRIPS is based on the misperception that IP protections serve as barriers to COVID-19 vaccine production. In fact, the difficulty of scaling up production is the key challenge. Waiving TRIPS will do nothing to increase vaccine production, represents poor policy toward IP, and will create a whole new set of trade policy challenges. A better approach is to build upon current global vaccine partnerships while ensuring that companies can secure their supply chains. Such efforts would increase access to vaccines while avoiding the potentially widespread and long-term problems associated with waiving IP protections provided by TRIPS.

#### US innovation lag gives Russia and China hypersonic dominance and breaks down nuclear deterrence

Ross 20

Russia, China, the U.S.: Who Will Win the Hypersonic Arms Race? When missiles fly beyond Mach 5, materials melt, airflow turns turbulent, and budgets enter the stratosphere | [Philip E. Ross](https://spectrum.ieee.org/author/ross-philip-e) (Philip E. Ross became a senior editor at IEEE Spectrum in June 2006. His interests include transportation, energy storage, artificial intelligence, natural-language processing, and the economic aspects of technology. He has reported on solar towers in Spain, cloud seeding in Nevada, telescopes atop a mountain in the Canaries, and robotic cars in California and Germany. He blogs mainly for [Cars That Think](https://spectrum.ieee.org/blog/cars-that-think), which won a 2015 Neal Award. Earlier in his career he worked for Red Herring, Forbes, Scientific American, and The New York Times. He has a master’s degree in international affairs from Columbia University and another, in journalism, from the University of Michigan.), 17 Nov 2020 | 16:00 GMT, https://spectrum.ieee.org/aerospace/aviation/russia-china-the-us-who-will-win-the-hypersonic-arms-race///(\*ak)

It’s obvious why the militaries of the world want missiles that can follow erratic paths at low altitude while flying at five times the speed of sound, eluding any chance at detection or interception. “Think of it as delivering a pizza, except it’s not a pizza,” says [Bradley Wheaton](https://www.facebook.com/afosr/posts/dr-brad-wheaton-and-his-team-at-jhu-applied-physics-laboratory-apl-are-working-t/10156523149046425/), a specialist in hypersonics at the Johns Hopkins University [Applied Physics Laboratory](https://www.jhuapl.edu/) (APL), in Maryland. “In the United States, just 15 minutes can cover the East Coast; a really fast missile takes 20 minutes to get to the West Coast. At these speeds, you have a factor of 50 increase in the area covered per unit of time.” So the question isn’t why the great powers are pursuing hypersonic arms, but why they are doing so now. Quick answer: They are once again locked in an arms race. The wider world first heard of this type of weaponry in March 2018, when Russian president Vladimir Putin [gave a speech](https://www.npr.org/sections/parallels/2018/03/01/590014611/experts-aghast-over-russian-claim-of-nuclear-powered-missile-with-unlimited-rang) describing his country’s plans for a nuclear-powered cruise missile that could fly around the world at blinding speed, then snake around hills and dales to a target. His bold assertions have been questioned, particularly the part about nuclear power. Even so, a year later [a nuclear accident killed seven people](https://www.nytimes.com/2019/08/12/world/europe/russia-nuclear-accident-putin.html) near a testing range off the northern coast of Russia, and U.S. intelligence officials speculated that it involved hypersonic experiments. The nature of that accident is still shrouded in mystery, but it’s clear there’s been a huge increase in the research effort in hypersonics. Here’s a roundup of what the superpowers of the 21st century are doing to pursue what is, in fact, an old concept. The hypersonic missiles in use or in testing in China and Russia can apparently carry either conventional warheads, aimed at ships and other small military targets, or nuclear ones, aimed at cities and government centers. These ship killers could deprive the United States of its preeminence at sea, which is more than enough reason for China, for instance, to develop hypersonics. But a nuclear-armed version that leaves the defender too little time to launch a retaliatory strike would do even more to shift the balance of power, because it would dismantle the painstakingly constructed system of deterrence known as mutually assured destruction, or by the jocular acronym MAD. “The nuclear side is very destabilizing, which is why the Russians are going after it,” says [Christopher Combs](https://engineering.utsa.edu/mechanical/team/combs/), a professor of mechanical engineering at the University of Texas at San Antonio. “But on the U.S. side we see no need for that, so we’re going conventional.” That is indeed the official U.S. policy. But in August, some months after Combs spoke with IEEE Spectrum, an Aviation Week article [pointed out](https://aviationweek.com/defense-space/missile-defense-weapons/usaf-errantly-reveals-research-icbm-range-hypersonic-glide) that an Air Force agency charged with nuclear weapons requested that companies submit ideas for a “thermal protection system that can support [a] hypersonic glide to ICBM ranges.” Soon after that, the request was hastily taken down, and the U.S. Air Force felt compelled to restate its policy not to pursue nuclear-capable hypersonic weapons. Today’s forays into hypersonic research have deep roots, [reaching back](https://www.nasa.gov/centers/dryden/history/milestones/50.html) to the late 1950s, in both the United States and the Soviet Union. Although this work continued for decades, in 1994, a few years after the Cold War ended with the dissolution of the Soviet Union, the United States pulled the plug on research into hypersonic flight, including its last and biggest program, the [Rockwell X-30](https://en.wikipedia.org/wiki/Rockwell_X-30). Nicknamed the “Orient Express,” the X-30 was to have been a crewed transport that would top out at 25 times the speed of sound, Mach 25—enough to take off from Washington, D.C., and land in Tokyo 2 hours later. Russia also discontinued research in this area during the 1990s, when its economy was in tatters. Today’s test vehicles just pick up where the old ones left off, explains [Alexander Fedorov](https://www.researchgate.net/profile/Alexander_Fedorov2), a professor at Moscow Institute of Physics and Technology and an expert on hypersonic flow at the boundary layer, which is right next to the vehicle’s skin. “What’s flying now is just a demonstration of technology—the science is 30 years old,” he says. Fedorov has lectured in the United States; he even helps U.S. graduate students with their research. He laments how the arms race has stifled international cooperation, adding that he himself has “zero knowledge” about the military project Putin touted two years ago. “But I know that people are working on it,” he adds. In the new race, Fedorov says, Russia has experience without much money, China has money without much experience, and the United States has both, although it revived its efforts later than did Russia or China and is now playing catch-up. For fiscal 2021, U.S. research agencies have budgeted US [$3.2 billion](https://fas.org/sgp/crs/weapons/R45811.pdf)[PDF] for all hypersonic weapons research, up from $2.6 billion in the previous year. Other programs are under way in India and Australia; even Israel and Iran are in the game, if on the sidelines. But Fedorov suggests that the Chinese are the ones to watch: They used to talk at international meetings, he says, but now they mostly just listen, which is what you’d expect if they had started working on truly new ideas—of which, he reiterates, there are very few on display. All the competing powers have shown vehicles that are “very conservative,” he says. One good reason for the rarity of radical designs is the enormous expense of the research. Engineers can learn only so much by running tests on the ground, using computational fluid-flow models and hypersonic wind tunnels, which themselves cost a pretty penny (and simulate only some limited aspects of hypersonic flight). Engineers really need to fly their creations, and usually when they do, they use up the test vehicle. That makes design iteration very costly. It’s no wonder hypersonic prototypes fail so often. In mere supersonic flight, passing Mach 1 is a clear-cut thing: The plane outdistances the sound waves that it imparts to the air to produce a shock wave, which forms the familiar [two-beat sonic boom](https://www.nasa.gov/centers/armstrong/news/FactSheets/FS-016-DFRC.html). But as the vehicle exceeds Mach 5, the density of the air just behind the shock wave diminishes, allowing the wave to [nestle along the surface](http://www.aerospaceweb.org/design/waverider/flow.shtml) of the vehicle. That in-your-face layer poses no aerodynamic problems, and it could even be an advantage, when it’s smooth. But it can become turbulent in a heartbeat. “Predicting when it’s going turbulent is hard,” says Wheaton, of Johns Hopkins APL. “And it’s important because when it does, heating goes up, and it affects how control surfaces can steer. Also, there’s more drag.” The pioneers of hypersonic flight learned about turbulence the hard way. On one of its many flights, in 1967, the U.S. Air Force’s X-15 experimental hypersonic plane went into a spin, killing the pilot, [Michael J. Adams](https://en.wikipedia.org/wiki/Michael_J._Adams). The right stuff, indeed. Hypersonic missiles come in two varieties. The first kind, launched into space on the tip of a ballistic missile, punches down into the atmosphere, then uses momentum to maneuver. Such “boost-glide” missiles have no jet engines and thus need no air inlets, so it’s easy to make them symmetrical, typically a tube with a cone-shape tip. Every part of the skin gets equal exposure to the air, which at these speeds breaks down into a plume of plasma, like the one that puts astronauts in radio silence during reentry. Boost-glide missiles are now operational. China appears to have deployed the first one, called the Dongfeng-17, a ballistic missile that carries glide vehicles. Some of those gliders are [billed as capable of knocking out U.S. Navy supercarriers](https://www.globaltimes.cn/content/1193485.shtml). For such a mission it need not pack a nuclear or even a conventional warhead, instead relying on its enormous kinetic energy to destroy its target. And there’s nothing that any country can now do to defend against it. “Those things are going so fast, you’re not going to get it,” General Mark Milley, chairman of the Joint Chiefs of Staff, said in March, in [testimony](https://www.armed-services.senate.gov/imo/media/doc/20-13_03-04-2020.pdf)[PDF] before Congress. You might think that you give up the element of surprise by starting with a ballistic trajectory. But not completely. Once the hypersonic missile comes out of its dive to fly horizontally, it becomes invisible to sparsely spaced radars, particularly the handful based in the Pacific Ocean. And that flat flight path can swerve a lot. That’s not because of any AI-managed magic—the vehicle just follows a randomized, preprogrammed set of turns. But the effect on those playing defense is the same: The pizza arrives before they can find their wallets. The second kind of hypersonic missile gets the bulk of its impulse from a jet engine that inhales air really fast, whirls it together with fuel, and burns the mixture in the instant that it tarries in the combustion chamber before blowing out the back as exhaust. Because these engines don’t need compressors but simply use the force of forward movement to ram air inside, and because that combustion proceeds supersonically, they are called supersonic ram jets—scramjets, for short. One advantage the scramjet has over the boost-glide missile is its ability to stay below radar and continue to maneuver over great distances, all the way to its target. And because it never enters outer space, it doesn’t need to ride a rocket booster, although it does need some powerful helper to get it up to the speed at which first a ramjet, and then a scramjet, can work. Another advantage of the scramjet is that it can, in principle, be applied for civilian purposes, moving people or packages that absolutely, positively have to be there quickly. The Europeans have such [a project](https://www.nbcnews.com/mach/science/hypersonic-airliner-would-take-you-los-angeles-tokyo-under-two-ncna1045986). So do the [Chinese](https://www.bbc.com/news/business-43151175), and Boeing has shown a [concept](https://www.space.com/41042-boeing-hypersonic-passenger-plane-concept.html). Everyone talks up this possibility because, frankly, it’s the only peaceable talking point there is for hypersonics. Don’t forget, though, that supersonic commercial flight happened long ago, made no money, and ended—and supersonic flight is way easier. The scramjet has one big disadvantage: It’s a lot harder technically. Any hypersonic vehicle must fend off the rapidly moving air outside, which can heat the leading edges to as high as [3,000 °C](https://www.asme.org/topics-resources/content/ceramics-make-hypersonic-flight-possibility#:~:text=Temperatures%20at%20the%20surface%20of,cones%20and%20leading%20edges%20intact.). But that heat and stress is nothing like the hellfire inside a scramjet engine. There, the heat cannot radiate away, it’s hard to keep the flame lit, and the insides can come apart second by second, affecting airflow and stability. Five minutes is a long time in this business. That’s why scramjets, though conceived in the 1950s, still remain a work in progress. In the early 2000s, NASA’s [X-43](https://en.wikipedia.org/wiki/NASA_X-43) used scramjets for about 10 seconds in fxlight. In 2013, [Boeing’s X-51 Waverider](https://en.wikipedia.org/wiki/Boeing_X-51_Waverider) flew at hypersonic speed for [210 seconds](https://www.flightglobal.com/pictures-and-animation-x-51a-waverider-reaches-mach-5-in-140s-scramjet-flight/93720.article) while under scramjet power. Tests on the ground have fared better. In May, workers at the Beijing Academy of Sciences ran a scramjet for 10 minutes, according to a [report](https://www.scmp.com/news/china/science/article/3086804/report-chinese-scramjet-test-challenge-most-advanced-missile) in the South China Morning Post. Two years earlier, the leader of the project, Fan Xuejun, [told the same newspaper](https://www.airuniversity.af.edu/CASI/Display/Article/1604494/chinas-opening-a-factory-to-build-engines-for-hypersonic-missiles-and-spaceplan/) that a factory was being built to construct a variety of scramjets, some supposedly for civilian application. One engine would use a combined cycle, with a turbojet to get off the ground, a ramjet to accelerate to near-hypersonic speed, a scramjet to blow past Mach 5, and maybe even a rocket to top off the thrust. That’s a lot of moving parts—and an ambition worthy of Elon Musk. But even Musk might hesitate to follow Putin’s proposal to use a nuclear reactor for energy. The cost of developing a scramjet capability is only one part of the economic challenge. The other is making the engine cheap enough to deploy and use in a routine way. To do that, you need fuel you can rely on. Early researchers worked with a class of highly energetic fuels that would react on contact with air, like triethylaluminum. “It’s a fantastic scramjet engine fuel, but very toxic, a bit like the hydrazine fuels used in rockets nowadays, and this became an inhibitor,” says [David Van Wie](https://www.linkedin.com/in/dave-vanwie-a8030a29), of Johns Hopkins APL, explaining why triethylaluminum was dropped from serious consideration. Next up was liquid hydrogen, which is also very reactive. But it needs elaborate cooling. Worse, it packs a rather low amount of energy into a given volume, and as a cryogenic fuel it is inconvenient to store and transport. It has been and still is used in experimental missiles, such as the X-43. Today’s choice for practical missiles is hydrocarbons, of the same ilk as jet fuel, but fancier. The Chinese scramjet that burned for 10 minutes—like others on the drawing board around the world—burns hydrocarbons. Here the problem lies in breaking down the hydrocarbon’s long molecular chains fast so the shards can bind with oxygen in the split second when the substances meet and mate. And a split second isn’t enough—you have to do it continuously, one split second after another, “like keeping a match lit in a hurricane,” in the [oft-quoted words](https://www.nasa.gov/missions/research/X-43_overview.html) of NASA spokesman Gary Creech, back in 2004. Scramjet designs try to protect the flame by shaping the inflow geometry to create an eddy, forming a calm zone not unlike the eye of a hurricane. Flameouts are particularly worrisome when the missile starts jinking about, thus disrupting the airflow. “It’s the ‘unstart’ phenomenon, where the shock wave at the air inlets stops the engine, and the vehicle will be lost,” says [John D. Schmisseur](https://www.utsi.edu/dr-john-schmisseur/), a researcher at the University of Tennessee Space Institute, in Tullahoma. And you really only get to meet such gremlins in actual flight, he adds. There are other problems besides flameout that arise when you’re inhaling a tornado. One expert, who requested anonymity, puts it this way: “If you’re ingesting air, it’s no longer air; it’s a complex mix of ionized atmosphere,” he says. “There’s no water anymore; it’s all hydrogen and oxygen, and the nitrogen is to some fraction elemental, not molecular. So combustion isn’t air and fuel—it’s whatever you’re taking in, whatever junk—which means chemistry at the inlet matters.” Simulating the chemistry is what makes hypersonic wind-tunnel tests problematic. It’s fairly simple to see how an airfoil responds aerodynamically to Mach 5—just cool the air so that the speed of sound drops, giving a higher Mach number for a given airspeed. But blowing cold air tells you only a small part of the story because it heads off all the chemistry you want to study. True, you can instead run your wind tunnel fast, hot, and dense—at “high enthalpy,” to use the term of art—but it’s hard to keep that maelstrom going for more than a few milliseconds. “Get the airspeed high enough to start up the chemistry and the reactions sap the energy,” says [Mark Gragston](https://mabe.utk.edu/people/mark-gragston/), an aerospace expert who’s also at the UT Space Institute. Getting access to such monster machines isn’t easy, either. “At Arnold Air Force Base, across the street from me, the Air Force does high-enthalpy wind-tunnel experiments,” he says. “They’re booked up three years in advance.” Other countries have more of the necessary wind tunnels; even India has [about a dozen](https://fas.org/sgp/crs/weapons/R45811.pdf)[PDF]. Right now, the United States is spending loads of money building these machines in an effort to catch up with Russia and China. You could say there is a wind-tunnel gap—one more reason U.S. researchers are keen for test flights. Another thing about cooling the air: It does wonders for any combustion engine, even the kind that pushes pistons. [Reaction Engines](https://www.reactionengines.co.uk/about/about-us), in Abingdon, England, appears to be the first to try to apply this phenomenon in flight, with a special precooling unit. In its less-ambitious scheme, the precooler sits in front of the air inlet of a standard turbojet, adding power and efficiency. In its more-ambitious concept, called [SABRE](https://www.reactionengines.co.uk/beyond-possible/sabre) (Synergetic Air Breathing Rocket Engine), the engine operates in combined mode: It takes off as a turbojet assisted by the precooler and accelerates until a ramjet can switch on, adding enough thrust to reach (but not exceed) Mach 5. Then, as the vehicle climbs and the atmosphere thins out, the engine switches to pure rocket mode, finally launching a payload into orbit. In principle, a precooler could work in a scramjet. But if anyone’s trying that, they’re not talking about it. Fast forward five years and boost-glide missiles will no doubt be deployed in the service of multiple countries. Jump ahead another 15 or 20 years, and the world’s superpowers will have scramjet missiles. So what? Won’t these things always play second fiddle to ballistic missiles? And won’t the defense also have its say, by unveiling superfast antimissiles and Buck Rogers–style directed-energy weapons? Perhaps not. The defense always has the harder job. As President John F. Kennedy [noted in an interview](https://www.presidency.ucsb.edu/documents/television-and-radio-interview-after-two-years-conversation-with-the-president) way back in 1962, when talking about antiballistic missile defense, what you are trying to do is shoot a bullet with a bullet. And, he added, you have to shoot down not just one but many, including a bodyguard of decoys. Today there are indeed antimissile defenses that can protect particular targets against ballistic missiles, at least when they’re not being fired in massive salvos. But you can’t defend everything, which is why the great powers still count on deterrence through mutually assured destruction. By that logic, if you can detect cruise missiles soon enough, you can at least make those who launched them wish they hadn’t. For that to work, we’ll need better eyes in the skies. In the United States, the military wants around $100 million for research on low-orbit space sensors to detect low-flying hypersonic missiles, Aviation Week [reported](https://aviationweek.com/defense-space/mda-seeking-108m-more-hypersonic-defense-sensors) in 2019. Hardly any of the recent advances in hypersonic flight result from new scientific discoveries; almost all of it stems from changes in political will. Powers that challenge the international status quo—China and Russia—have found the resources and the will to shape the arms race to their benefit. Powers that benefit from the status quo—the United States, above all—are responding in kind. Politicians fired the starting pistol, and the technologists are gamely leaping forward. And the point? There is no point. It’s an arms race.

#### US innovation and hypersonic competitivity is vital to nuclear deterrence- The risk is existential

Polsgrove 8-20

OCTOBER 20, 2020 [Nuclear War Makes a Comeback](https://www.counterpunch.org/2020/10/20/nuclear-war-makes-a-comeback/) BY [CAROL POLSGROVE](https://www.counterpunch.org/author/carolpolsgrove/) (She holds Ph. D. and M.A. degrees in English from the University of Louisville and an M.A.) | <https://www.counterpunch.org/2020/10/20/nuclear-war-makes-a-comeback/>//(\*ak)

On websites where policy makers, scholars, and military leaders gather, concern about the possibility of nuclear war has been rising sharply in recent months as China, the United States, and Russia develop new weapons and new ways of using old ones. On [War on the Rocks](https://warontherocks.com/2020/08/managing-the-sino-american-dispute-over-missile-defense/), an online platform for national security articles and podcasts, Tong Zhao, a senior fellow at the Carnegie-Tsinghua Center for Global Policy, reported August 11 on public calls in China “to quickly and massively build up its nuclear forces” on the theory that only a “more robust nuclear posture” would prevent war with the United States. The biggest nuclear arms budget ever is nearing approval in the US Congress, and the Trump administration has raised the possibility of resuming nuclear tests. President Trump has pulled the United States out of the1987 Intermediate-Range Nuclear Forces (INF) treaty with Russia, while the New Start Treaty capping Russian and U.S. nuclear warheads and delivery systems is set to expire next February if the two countries don’t agree to extend it. For its part, Russia appears poised to equip its navy with hypersonic nuclear strike weapons, and according to the British newspaper [The Independent](https://www.independent.co.uk/news/world/europe/russia-nuclear-weapons-hypersonic-vladimir-putin-poseidon-drone-tsirkon-a9638921.html), “The Russian premier has repeatedly spoken of his wish to develop a new generation of nuclear weapons that can be targeted anywhere on the planet.” Meanwhile, momentum to stop the proliferation of nuclear weapons has faltered. Nine nations now hold nuclear arms in an increasingly unsettled international scene. [Recent research](https://advances.sciencemag.org/content/5/10/eaay5478) has shown that a nuclear exchange between just two of those with lesser arsenals—India and Pakistan— “could directly kill about 2.5 times as many as died worldwide in WWII, and in this nuclear war, the fatalities could occur in a single week.” Burning cities would throw so much soot into the upper atmosphere that temperatures and precipitation levels would fall across much of the earth—bringing widespread drought, famine, and death. Clashes between India, Pakistan, and other nuclear armed states have become frequent enough that the International Red Cross marked the 75th anniversary of the bombings of Hiroshima and Nagasaki with [a warning](https://media.ifrc.org/ifrc/press-release/international-red-cross-red-crescent-movement-urges-nations-end-nuclear-era): “[T]he risk of use of nuclear weapons has risen to levels not seen since the end of the Cold War.” For 75 years, the nuclear Sword of Damocles has dangled over the earth. There is widespread agreement among analysts that the long lull may soon be over—due in part, to the end of the Cold War. During those decades, the United States and the USSR cooperated not only to avoid bombing each other into oblivion but also to discourage other nations from gaining their own nuclear arms, in part by spreading their nuclear umbrellas over their allies. That international system has dissolved. In addition to the United States, Russia, and China, other nations have nuclear weapons and more are likely to acquire them. And a new possibility has appeared on the horizon: the increased likelihood that nuclear weapons could be introduced into conventional warfare in regional wars. In [a monograph](https://cgsr.llnl.gov/content/assets/docs/CGSR_LP4-FINAL.pdf) published by Lawrence Livermore Laboratory, US defense policy and strategy analyst John K. Warden writes that “in the capitals of potential adversary countries,” the idea is taking hold “that nuclear wars can be won because they can be kept limited, and thus can be fought—even against the United States.” What can the United States do to convince adversaries not to introduce nuclear weapons into a conventional war—to make clear, in advance, that taking such a step would lead to fatal consequences for the country that took it? The answer from the US national security establishment, as the fiscal 2021 defense budget suggests, is a readiness to fight fire with fire: If the “adversaries” of the United States hold out the threat of introducing nuclear weapons in a conventional war, then (the argument goes) they should expect that the United States will respond in kind. How many weapons and delivery systems would that require? A lot, according to the nuclear budget for the Departments of Defense and Energy now going through Congress. At a time when Covid-19 has shaken the foundations of the federal budget, Congress is close to [approving $44.5 billion](https://www.armscontrol.org/act/2020-03/news/us-nuclear-budget-skyrockets) for fiscal 2121 to modernize nuclear warheads, delivery systems, and the infrastructure that supports them. Sierra Club Nuclear Policy Director John Coequyt has [called on Congress](https://www.sierraclub.org/press-releases/2020/08/75th-anniversary-japan-nuclear-bombings-sierra-club-continues-calls-for#:~:text=In%20response%2C%20Sierra%20Club%20Nuclear,of%20all%20nuclear%20weapons%20worldwide) “to resist the current renewal of the nuclear arms race and to ban the use of nuclear weapons,” and Sierra Club members have mobilized to try to stop funding for nuclear war projects in their neighborhoods. In South Carolina, for instance, Tom Clements, Sierra Club member and director of Savannah River Site Watch, has joined other groups in [challenging plans](file:///\\users\carolpolsgrove\Downloads\%5bhttps:\srswatch.org\wp-content\uploads\2020\06\SRS-Watch-news-on-pit-plant-petition-to-DOE-June-24-2020.pdf) for expanded plutonium pit production at the Savannah River Site. And the Ohio Sierra Club’s Nuclear Free Committee has [opposed production](https://content.sierraclub.org/grassrootsnetwork/sites/content.sierraclub.org.activistnetwork/files/teams/documents/Ohio%2C%20Centrus%2C%20Saudi%20Nuclear%20Bomb%20Sierra%201-2020.pdf) at the Portsmouth Nuclear Site in Piketon of “high-assay low-enriched uranium” that could be upgraded for weapons use, in the United States or elsewhere. While such efforts often focus on local effects of nuclear weapons production, they also manifest a larger concern. Says the Club’s Nuclear Free Core Team’s Mark Muhich, the renewed nuclear arms race is “an existential threat both to human civilization and to the earth.”

#### Innovation is an impact filter---it encompasses AND outweighs every existential threat.

Matthews 18 Dylan Co-founder of Vox, citing Nick Beckstead @ Rutgers University. 10-26-2018. "How to help people millions of years from now." Vox. <https://www.vox.com/future-perfect/2018/10/26/18023366/far-future-effective-altruism-existential-risk-doing-good> brett

If you care about improving human lives, you should overwhelmingly care about those quadrillions of lives rather than the comparatively small number of people alive today. The 7.6 billion people now living, after all, amount to less than 0.003 percent of the population that will live in the future. It’s reasonable to suggest that those quadrillions of future people have, accordingly, hundreds of thousands of times more moral weight than those of us living here today do. That’s the basic argument behind Nick Beckstead’s 2013 Rutgers philosophy dissertation, “On the overwhelming importance of shaping the far future.” It’s a glorious mindfuck of a thesis, not least because Beckstead shows very convincingly that this is a conclusion any plausible moral view would reach. It’s not just something that weird utilitarians have to deal with. And Beckstead, to his considerable credit, walks the walk on this. He works at the Open Philanthropy Project on grants relating to the far future and runs a charitable fund for donors who want to prioritize the far future. And arguments from him and others have turned “long-termism” into a very vibrant, important strand of the effective altruism community. But what does prioritizing the far future even mean? The most literal thing it could mean is preventing human extinction, to ensure that the species persists as long as possible. For the long-term-focused effective altruists I know, that typically means identifying concrete threats to humanity’s continued existence — like unfriendly artificial intelligence, or a pandemic, or global warming/out of control geoengineering — and engaging in activities to prevent that specific eventuality. But in a set of slides he made in 2013, Beckstead makes a compelling case that while that’s certainly part of what caring about the far future entails, approaches that address specific threats to humanity (which he calls “targeted” approaches to the far future) have to complement “broad” approaches, where instead of trying to predict what’s going to kill us all, you just generally try to keep civilization running as best it can, so that it is, as a whole, well-equipped to deal with potential extinction events in the future, not just in 2030 or 2040 but in 3500 or 95000 or even 37 million. In other words, caring about the far future doesn’t mean just paying attention to low-probability risks of total annihilation; it also means acting on pressing needs now. For example: We’re going to be better prepared to prevent extinction from AI or a supervirus or global warming if society as a whole makes a lot of scientific progress. And a significant bottleneck there is that the vast majority of humanity doesn’t get high-enough-quality education to engage in scientific research, if they want to, which reduces the odds that we have enough trained scientists to come up with the breakthroughs we need as a civilization to survive and thrive. So maybe one of the best things we can do for the far future is to improve school systems — here and now — to harness the group economist Raj Chetty calls “lost Einsteins” (potential innovators who are thwarted by poverty and inequality in rich countries) and, more importantly, the hundreds of millions of kids in developing countries dealing with even worse education systems than those in depressed communities in the rich world. What if living ethically for the far future means living ethically now? Beckstead mentions some other broad, or very broad, ideas (these are all his descriptions): Help make computers faster so that people everywhere can work more efficiently Change intellectual property law so that technological innovation can happen more quickly Advocate for open borders so that people from poorly governed countries can move to better-governed countries and be more productive Meta-research: improve incentives and norms in academic work to better advance human knowledge Improve education Advocate for political party X to make future people have values more like political party X ”If you look at these areas (economic growth and technological progress, access to information, individual capability, social coordination, motives) a lot of everyday good works contribute,” Beckstead writes. “An implication of this is that a lot of everyday good works are good from a broad perspective, even though hardly anyone thinks explicitly in terms of far future standards.” Look at those examples again: It’s just a list of what normal altruistically motivated people, not effective altruism folks, generally do. Charities in the US love talking about the lost opportunities for innovation that poverty creates. Lots of smart people who want to make a difference become scientists, or try to work as teachers or on improving education policy, and lord knows there are plenty of people who become political party operatives out of a conviction that the moral consequences of the party’s platform are good. All of which is to say: Maybe effective altruists aren’t that special, or at least maybe we don’t have access to that many specific and weird conclusions about how best to help the world. If the far future is what matters, and generally trying to make the world work better is among the best ways to help the far future, then effective altruism just becomes plain ol’ do-goodery.\*

## 2

#### CP text: The member nations of the WTO ought to

* Only remove trade secret protections for pharmaceutical companies
* Allow trade secrecy policies to be overridden domestically in every country

Durkin et al 21 [Allison Durkin JD @ Yale, Grad Research asst. @Yale&Stanford; Patricia Anne Sta Maria Assc. Solicitor @ Office of the Solicitor General; Brandon Willmore JD @ Yale; and Amy Kapczynski Professor of Law @ Yale] Addressing the Risks That Trade Secret Protections Pose for Health and Rights, 6-16-2021, Health and Human Rights Journal, https://www.hhrjournal.org/2021/06/addressing-the-risks-that-trade-secret-protections-pose-for-health-and-rights/, accessed 8-1-2021 /ramamurty

How, then, can states create or expand safeguards against overly expansive trade secret protections? Three areas deserve particular attention. First, states should guard against the entrenchment of trade secrets as human rights or constitutional rights and reject attempts to enshrine stronger trade secrets law in international law, particularly without adequate and explicit protection of safeguards. Second, states should protect the public’s interest in health data by limiting trade secret law and allowing it to be overridden where public health benefits are salient. Third, countries should adopt robust whistleblower safeguards. Avoiding the entrenchment of trade secret protections Trade secret law has not been upwardly harmonized in international law to the same degree as other kinds of intellectual property. It will be important for countries to maintain policy space to modify and adjust domestic trade secret law, particularly given how rapidly information technologies are evolving and the broad scope of trade secret law today. Like other forms of intellectual property, trade secret rights are predominantly held by corporations and do not have the status of human rights, nor should they. These rights emerged out of practices that protected commercial morality and fairness between business competitors, and they have no grounding in the rights reflected in international human rights treaties. States should also consider carefully the implications of treating trade secrecy as a form of property subject to protection under domestic constitutional law. The US experience shows that treating trade secrets as constitutionally protected property creates real risks for the publicity of health information, as in the tobacco case mentioned above. If trade secrets are protected as property, states are more limited in their ability to require the sharing of health data to improve outcomes or to develop new technologies, for example, because they may only do so after compensating the originator. Trade secret law is also plausibly understood more as a means to regulate behavior in the commercial sphere—a kind of tort or unfair competition law—rather than a right that is “good against the world” that should properly be deemed “property” for constitutional purposes. It is also not obvious that judicial review and mandatory compensation are essential to protect private interests: states can voluntarily afford compensation to companies when needed to protect incentives without judicial mandates.

#### Trade Secrets harm innovation

Contigiani and Hsu 19 [Andrea Contigiani, Assst. Prof of Management @Ohio State; and David H. Hsu, David Hsu is the Richard A. Sapp Professor of Management at the Wharton School, University of Pennsylvania. He graduated from Stanford University with undergraduate majors in economics and political science. After a few years working in industry, he received his master’s degree in public policy from Harvard University, followed by his Ph.D. in management from the Massachusetts Institute of Technology] How Trade Secrets Hurt Innovation, 1-29-2019, Harvard Business Review, https://hbr.org/2019/01/how-trade-secrets-hurt-innovation, accessed 8-1-2021 ///ramamurty

The first form of IPP that typically comes to mind is patenting to claim ownership. While the strength of the patent system varies across geographies, patent protection is well-established and increasingly homogeneous around the world. But studies show that when asked about their IPP strategies, both managers of large enterprises and entrepreneurs often respond that other tools are more important than patents. In particular, trade secrecy, where companies choose not to disclose information about their inventions, is considered an increasingly important defense strategy and source of competitive advantage. One of the primary ways that employers seek to protect trade secrets is by having employees sign non-compete contracts and non-disclosure agreements – these aim to prevent employees from moving to competitors and from disclosing valuable information to new employers. But while greater trade secrecy may protect existing innovations, it’s not clear how this might affect future innovation. In a recent study, we examine this issue, and find that strengthening employers’ trade secrecy protection can backfire by dampening inventors’ productivity and hurting innovation in the long run. U.S. Trade Secrecy Law In the U.S., the current trade secrecy regulation is largely the outcome of the Uniform Trade Secrets Act (UTSA), introduced ... At least in the academic literature, the effect of stronger protections for trade secrecy is ambiguous. On the one hand, a more employer-friendly trade secrecy regime – meaning more trade secrecy rights are allocated to employers at the expense of employees – would incentivize firms to invest more in their workers, because it is now harder for those employees to abscond with the firm’s trade secrets. Under this theory, better innovation output is the likely result. But a lot of innovation research suggests that innovation comes from recombining ideas, from different fields, experiences, and organizations. (For example, Ford’s Model T assembly line technologies were said to have originated from meat-packing plant factories.) To the extent that a more employer-friendly trade secrecy regime limits employee mobility across companies, the opportunities for idea circulation in the economy could be curtailed – thus potentially harming innovation. Another set of theories also suggests that stronger trade secrecy protections may diminish innovation – but for an entirely different reason. This view says that if it’s harder for employees to switch firms, they have less incentive to drive up their market value by demonstrating their productivity – and this reduced incentive could result in dampened innovation output. In other words, placing the brakes on rewarding innovative effort may end up harming innovation outcomes. So we have one theory that predicts a stronger trade secrecy regime will bolster innovation and two reasons to believe it will dampen it. To find out what actually happens, we focused on a specific change in the legal environment surrounding trade secrecy protection: the adoption of the inevitable disclosure doctrine (IDD) in some U.S. states and not others, starting in 1994. The IDD allows a company to seek an injunction in court to prohibit a former employee from working for a competitor for a certain period of time, if they can show it would not be possible for the employee to perform her job without inevitably disclosing the company’s trade secret. A landmark case applying the IDD is PepsiCo, Inc. v. Redmond. In this case, William Redmond, a manager at PepsiCo in the early 1990s, accepted a job at a competing sports drink company, Quaker, in 1994. PepsiCo filed suit in the 7th District Court in Illinois, arguing that Redmond had access to trade secrets related to pricing, distribution, packaging, and marketing, and that he could not perform his new job without inevitably disclosing them. PepsiCo won, and in December 1994 the court enjoined Redmond from taking the new position through May 1995. Soon after this ruling, four other U.S. state courts adopted a pro-IDD stance. We conducted an empirical analysis to understand how IDD affected the innovative productivity of inventors. We compared the patenting productivity of inventors in states that adopted IDD to the productivity of inventors in states that didn’t adopt IDD. In all, our sample spans the 1976-2003 time period, and analyzes the patenting outcomes of over 350,000 distinct inventors over that time span, for a total of over 2.5 million inventor-year observations. We found that IDD had a negative effect on innovation, and specifically on innovation quality (which we measured by patent counts weighted by patent-forward citations). Inventors based in states where IDD was enforced innovated less compared to before IDD took hold and also compared to comparable inventors in non-IDD states. These results continue to hold after also including a wide range of controls for differences in inventor, invention, and firm characteristics.

## 3

#### Dollar centrality high now

Watts 6/21

Watts, William. “Why the U.S. Dollar Is Soaring - and What's next - AFTER Fed's Change in Tone.” MarketWatch, MarketWatch, 17 June 2021, [www.marketwatch.com/story/soaring-u-s-dollar-sparks-forex-market-rethink-after-fed-shifts-tone-11623955943. //](http://www.marketwatch.com/story/soaring-u-s-dollar-sparks-forex-market-rethink-after-fed-shifts-tone-11623955943.%20//) Phoenix

The U.S. dollar was on fire Thursday, extending gains a day after an unexpected shift in the Federal Reserve’s inflation and interest-rate outlook and raising doubts about the consensus view for a weaker currency in 2021.

“Up until yesterday the market consensus was pointing to a moderately softer value of the DXY dollar index over the course of the coming 2 quarters,” said Jane Foley, senior FX strategist at Rabobank, in a note. “The price activity in the USD (U.S. dollar) crosses today suggests that a revaluation of positioning is currently taking place.”

The ICE U.S. Dollar Index [DXY, 0.03%](https://www.marketwatch.com/investing/index/DXY?mod=MW_story_quote), a measure of the currency against a basket of six major rivals, was up 0.9% at 91.94 Thursday afternoon, after trading at its highest since April 13. The dollar is building on a surge versus major rivals scored on Wednesday, after Fed policy makers penciled in [two rate hikes by the end of 2023](https://www.marketwatch.com/story/fed-now-sees-two-interes-trate-hikes-in-2023-11623866824?mod=mw_latestnews) and discussed the eventual tapering of the central bank’s asset buying program.

#### IPR is key for U.S Dollar Centrality – it allows US firms near if not complete monopolies pushing dollars into international markets and stabilizing US financial influence

Schwartz ‘19

Schwartz, Herman Mark (2019). American hegemony: intellectual property rights, dollar centrality, and infrastructural power. Review of International Political Economy, (), 1–30. doi:10.1080/09692290.2019.1597754 // Phoenix

Mechanism one relates to Strange’s (1989) financial power: US current account deficits generate the dollar centrality that network analyses reveal through self-reinforcing dynamics prior to the network. US current account deficits result from deep seated domestic institutional arrangements in current account surplus economies that produce chronic domestic demand shortfalls. The more those export-led economies run surpluses with the United States, the more dollars they accumulate; the more dollars they accumulate, the more dollars flow through their banking systems back into dollar assets and liabilities; the more dollar assets and liabilities those banks hold on their balance sheets, the more those banks both rely on the Federal Reserve Bank (FED) as a lender of last resort or a supplier of outside money during (the inevitable) crises, and the more their staff develop habitus (Bourdieu, 1977) or the routinized behaviors at the heart of infrastructural power (Mann, 1986) that support continued use of the dollar in non-crisis times; the more those banks lend in dollars, the more counterparty debtor economies are drawn into use of the dollar; a parallel habitus emerges among export firms that reinforces use of the dollar in a Hirschman (1945)-like dynamic. If suppliers (or debtors) are borrowing those recycled dollars, they will demand payment in dollars to meet their liabilities. Contemporary late developers similarly need export markets to grow, and the United States constitutes both the biggest import market and biggest net importer in the global economy (netting intra-EU trade). This mechanism originates from institutional responses to the problem of late development and not, via lower transaction costs, the emergent network of dollar claims and liabilities itself. That said, surely dollar acceptability faces limits set by persistent US current account deficits? Prudent actors might well balk at accepting more assets denominated in a currency at risk of sustained depreciation (Bergsten & Williamson, 2004). Indeed, the 1960s Triffin dilemma pitted declining confidence about the dollar as a store of value given rising US inflation rates and a declining productivity gap between the United States and its main competitors against the need for global liquidity supplied by a US current account deficit. Today, as Eichengreen (2010) has argued, centrality for the dollar faces a similar collective action problem among holders of dollar-denominated assets – why do US current account deficits not motivate individual countries with relatively smaller dollar holdings to defect for fear of depreciation or capital losses? In today’s flexible exchange rate world, only above average US economic growth and/or profits for the firms constituting the bulk of equity market capitalization validates confidence in dollar assets. Because economic activity is organized through capitalist markets, the critical issue for differential growth (Nitzan, 1998) and asset validation is always: ‘who gets the profits and in what proportion’? Mechanism two is thus about profits, which corresponds to Strange’s (1989) productive power. US firms capture a disproportionate share of global profits, and within this firms with robust intellectual property rights (IPRs – patent, copyright brand and trademark) capture a disproportionate share of US and global profits. Here compliance with international trade treaties protecting IPRs is the focal point or center of gravity for this disproportionality. IPRs give some US firms monopoly or near monopoly power in the global (and local) commodity chains they construct. The extension of US IPR law through various trade treaties (Drahos & Braithwaite, 2003; Sell, 2003; Sell & Prakash, 2004) allows US IPR firms to capture a disproportionate share of global profits via that monopoly power. This shifts claims on value added towards those firms, concentrating profits into a small number of US firms. Though we explore this below in more depth, US firms account for a disproportionate 33.9% of cumulative profits generated by any firm appearing on the Forbes Global 2000 list from 2006 to 2018 and firms in sectors characterized by robust IPRs account for a disproportionate 26.6% of those profits. Profitability thus also rests on infrastructural power, via compliance with trade treaties and enmeshment in global value chains orchestrated by US firms. As with bank behavior, this compliance is not purely voluntary (Gruber, 2000), but rather reflects a gradient in which mutually beneficial cooperation shades into coercion as the proportion of local firms benefiting from those treaties declines. US firms are not the only ones that possess marketable intellectual property. Non-US firms that also benefit from robust global IPRs broaden the global political coalition for creating and expanding those IPRs. Yet US firms tend to control the commodity chains in which those foreign firms participate. These two mechanisms are connected: the first explains why non-US actors receive dollars (more precisely, dollar-denominated assets) and the second explains why they opt to hold those assets; put differently, the supply of and demand for dollars. The two mechanisms transform the exorbitant burden – current account deficits associated with use of the dollar as the international reserve currency – back into an exorbitant privilege. They represent a transfer of real resources back to the US economy in exchange for promises to pay back something in the future. Finally, though we will not explore this in depth, these two mechanisms are also linked to the military side of US power, where a similar logic of dominance over potential peer rivals has driven science policy and technological innovation. Put bluntly, a military-innovation complex (c.f. Eisenhower’s military-industrial complex (Hozic, 1999; Hurt, 2010; Mazzucato, 2015; Weiss, 2014)) is the research foundation for the high profit US IPR firms that in turn feed a substantial portion of cash back into the IMS. As with all such systems of power, these structural strengths contain endogenously generated weaknesses and face on-going challenges from the less powerful. Financialization and profit strategies built on IPRs endogenously produce income inequality among firms and people, which erodes compliance, potentially slows growth and destabilizes the global financial system. Domestically, the current account deficits necessary for a dollar-centric IMS (Germain & Schwartz, 2014) generated part of the anger motivating the populist voting bloc that elected Trump. In turn, the Trump Administration’s erratic trade policy, its assaults on parts of the military-innovation complex, and, most significantly, its efforts to eviscerate financial regulation simultaneously threaten the dollar’s role in the IMS and US firms’ ability to capture global profits.3 The Trump administration is one logical consequence of current account deficits that have hollowed out manufacturing employment and limited upward mobility to a narrow slice of the US population. The paper thus has four sections corresponding to the issues: Why does infrastructural power matter? Why the IMS? Why IPRs? The conclusion considers critical endogenous sources of decay.

#### Dollar centrality is the backbone of heg – it creates dependency, allows the U.S to fund the military and bypasses policy trade offs

Costigan ‘17

Thomas Costigan, Drew Cottle, & Angela Keys. (2017). The US Dollar as the Global Reserve Currency: Implications for US Hegemony. World Review of Political Economy, 8(1), 104. doi:10.13169/worlrevipoliecon.8.1.0104 Lindale PP

This article contends that the dollar as the global reserve currency has been crucial to the operations of US hegemony during the post-World War II period. To investigate this issue, the theoretical perspective of World-Systems Analysis expounded by Immanuel Wallerstein (2011) is employed. The article also draws upon the theoretical work of Henry C.K. Liu who developed the term “US dollar hegemony” (Liu 2002). In this article, we argue that US planners from the Council on Foreign Relations (CFR) in conjunction with State Department officials pursued a deliberate plan to make the United States a global hegemonic power (Shoup and Minter 1977) and the dollar was the central currency of that hegemony (Engdahl 2008, 213). We demonstrate how the dollar evolved into a petro-currency through Nixon’s Saudi decision of 1973. The dollar was placed on the trajectory that it would follow for decades and became the source of conflict against the United States by its geo-political competitors (Durden 2014). We conclude by arguing that newly emerging strategic competitors to US hegemony such as China, Russia and Iran are growing dissatisfied with the current oil trading arrangements. We do not argue that any of these nations are remotely in contention to replace the United States as world hegemon. However, we suggest that a significant blow could be dealt to the ability of the United States to maintain its hegemonic status should oil trading be carried out in currencies other than the dollar (Koenig 2015). If this were to occur to a large enough extent, the ability of the United States to exercise its foreign policy would be severely curtailed (National Intelligence Council [NIC] 2012). It would also demonstrate the critical importance of the US dollar in the exercise of US hegemony. In this article, we would like to move the dollar to the forefront of debate in understating how US hegemony in the postWorld War II period is constructed and maintained and its critical importance in a hegemonic US global agenda. The post-World War II era represented a radical paradigm shift in US foreign policy. This policy shift was defined by the “Grand Area” concept developed by the CFR in conjunction with planners from the US State Department. This programme saw the United States pursue a global hegemonic project (Shoup 1975). This pursuit was economic in nature; it would require binding together disparate regions of the world into a financial system that would centre upon, and serve the interests of, the US economy (Shoup and Minter 1977). US imperialism was the result of extensive planning on the part of the US government (Panitch and Gindin 2012, 72). The Bretton Woods Conference held in 1944 was the forum where a US-centric world system was instituted. The systems, institutions and arrangements that facilitate US hegemony were established at the Bretton Woods Conference. The most critical of these components for the functioning of US hegemony were the creation of the International Monetary Fund (IMF) and the World Bank, the adoption of the US dollar as the global reserve currency, and the “pegging” of the US dollar to the gold standard (Vasudevan 2008, 35). The Bretton Woods Conference instituted a world system where the US dollar was at the centre of the global economy; the value of a nation’s currency was determined in relation to the US dollar, and “most international transactions were denominated in dollars” (Engdahl 2008). The Grand Area strategy pursued by the United States was intended to defend US national interests in the aftermath of World War II. Those national interests were, in fact, US elite and corporate interests (Shoup and Minter 1977). After World War II, the United States designed a liberal international system in which it would be the primary beneficiary (Mastanduno 2009). Economics and security became inseparably linked for the United States, and the dollar was the core of this new paradigm. According to Mastanduno, as the global reserve currency, the US dollar became the “lynchpin” of Trans-Atlantic and TransPacific trade: This critical role for the dollar granted a well-understood privilege to U.S. policymakers. As long as other governments proved willing to hold dollars, U.S. external deficits could be financed essentially by printing money and lending it abroad, enabling the United States to pursue a variety of foreign and domestic policy objectives without necessarily confronting difficult trade-offs in the short term.

#### Hegemony is a sustainable method to disincentivize great power war and escalation -- absent that, power vacuums cause nuclear prolif, arms races and extinction.

Brands, 15 [Hal Brands, on the faculty at the Sanford School of Public Policy at Duke University, “The Elliott School of International Affairs,” The Washington Quarterly Summer, 2015, 38:2 pp. 7–28] rc//Townes rc again// Phoenix

The fundamental reason is that both U.S. influence and international stability are thoroughly interwoven with a robust U.S. forward presence. Regarding influence, the protection that Washington has afforded its allies has equally afforded the United States great sway over those allies’ policies.43 During the Cold War and after, for instance, the United States has used the influence provided by its security posture to veto allies’ pursuit of nuclear weapons, to obtain more advantageous terms in financial and trade agreements, and even to affect the composition of allied nations’ governments.44 More broadly, it has used its alliances as vehicles for shaping political, security, and economic agendas in key regions and bilateral relationships, thus giving the United States an outsized voice on a range of important issues. To be clear, this influence has never been as pervasive as U.S. officials might like, or as some observers might imagine. But by any reasonable standard of comparison, it has nonetheless been remarkable. One can tell a similar story about the relative stability of the post-war order. As even some leading offshore balancers have acknowledged, the lack of conflict in regions like Europe in recent decades is not something that has occurred naturally. It has occurred because the “American pacifier” has suppressed precisely the dynamics that previously fostered geopolitical turmoil. That pacifier has limited arms races and security competitions by providing the protection that allows other countries to under-build their militaries. It has soothed historical rivalries by affording a climate of security in which powerful countries like Germany and Japan could be revived economically and reintegrated into thriving and fairly cooperative regional orders. It has induced caution in the behavior of allies and adversaries alike, deterring aggression and dissuading other destabilizing behavior. As John Mearsheimer has noted, the United States “effectively acts as a night watchman,” lending order to an otherwise disorderly and anarchical environment.45 What would happen if Washington backed away from this role? The most logical answer is that both U.S. influence and global stability would suffer. With respect to influence, the United States would effectively be surrendering the most powerful bargaining chip it has traditionally wielded in dealing with friends and allies, and jeopardizing the position of leadership it has used to shape bilateral and regional agendas for decades. The consequences would seem no less damaging where stability is concerned. As offshore balancers have argued, it may be that U.S. retrenchment would force local powers to spend more on defense, while perhaps assuaging certain points of friction with countries that feel threatened or encircled by U.S. presence. But it equally stands to reason that removing the American pacifier would liberate the more destabilizing influences that U.S. policy had previously stifled. Long-dormant security competitions might reawaken as countries armed themselves more vigorously; historical antagonisms between old rivals might reemerge in the absence of a robust U.S. presence and the reassurance it provides. Moreover, countries that seek to revise existing regional orders in their favor—think Russia in Europe, or China in Asia—might indeed applaud U.S. retrenchment, but they might just as plausibly feel empowered to more assertively press their interests. If the United States has been a kind of Leviathan in key regions, Mearsheimer acknowledges, then “take away that Leviathan and there is likely to be big trouble.”46 Scanning the global horizon today, one can easily see where such trouble might arise. In Europe, a revisionist Russia is already destabilizing its neighbors and contesting the post-Cold War settlement in the region. In the Gulf and broader Middle East, the threat of Iranian ascendancy has stoked region-wide tensions manifesting in proxy wars and hints of an incipient arms race, even as that region also contends with a severe threat to its stability in the form of the Islamic State. In East Asia, a rising China is challenging the regional status quo in numerous ways, sounding alarms among its neighbors—many of whom also have historical grievances against each other. In these circumstances, removing the American pacifier would likely yield not low-cost stability, but increased conflict and upheaval. That conflict and upheaval, in turn, would be quite damaging to U.S. interests even if it did not result in the nightmare scenario of a hostile power dominating a key region. It is hard to imagine, for instance, that increased instability and acrimony would produce the robust multilateral cooperation necessary to deal with transnational threats from pandemics to piracy. More problematic still might be the economic consequences. As scholars like Michael Mandelbaum have argued, the enormous progress toward global prosperity and integration that has occurred since World War II (and now the Cold War) has come in the climate of relative stability and security provided largely by the United States.47 One simply cannot confidently predict that this progress would endure amid escalating geopolitical competition in regions of enormous importance to the world economy. Perhaps the greatest risk that a strategy of offshore balancing would run, of course, is that a key region might not be able to maintain its own balance following U.S. retrenchment. That prospect might have seemed far-fetched in the early post-Cold War era, and it remains unlikely in the immediate future. But in East Asia particularly, the rise and growing assertiveness of China has highlighted the medium- to long-term danger that a hostile power could in fact gain regional primacy. If China’s economy continues to grow rapidly, and if Beijing continues to increase military spending by 10 percent or more each year, then its neighbors will ultimately face grave challenges in containing Chinese power even if they join forces in that endeavor. This possibility, ironically, is one to which leading advocates of retrenchment have been attuned. “The United States will have to play a key role in countering China,” Mearshimer writes, “because its Asian neighbors are not strong enough to do it by themselves.”48 If this is true, however, then offshore balancing becomes a dangerous and potentially self-defeating strategy. As mentioned above, it could lead countries like Japan and South Korea to seek nuclear weapons, thereby stoking arms races and elevating regional tensions. Alternatively, and perhaps more worryingly, it might encourage the scenario that offshore balancers seek to avoid, by easing China’s ascent to regional hegemony. As Robert Gilpin has written, “Retrenchment by its very nature is an indication of relative weakness and declining power, and thus retrenchment can have a deteriorating effect on relations with allies and rivals.”49 In East Asia today, U.S. allies rely on U.S. reassurance to navigate increasingly fraught relationships with a more assertive China precisely because they understand that they will have great trouble balancing Beijing on their own. A significant U.S. retrenchment might therefore tempt these countries to acquiesce to, or bandwagon with, a rising China if they felt that prospects for successful resistance were diminishing as the United States retreated.50 In the same vein, retrenchment would compromise alliance relationships, basing agreements, and other assets that might help Washington check Chinese power in the first place—and that would allow the United States to surge additional forces into theater in a crisis. In sum, if one expects that Asian countries will be unable to counter China themselves, then reducing U.S. influence and leverage in the region is a curious policy. Offshore balancing might promise to preserve a stable and advantageous environment while reducing U.S. burdens. But upon closer analysis, the probable outcomes of the strategy seem more perilous and destabilizing than its proponents acknowledge.

# Case

### COVID

#### The waiver takes years for results

Rajesh Vellakkat 21, LLM Student, London School of Economics and Political Science and Partner of Fox Mandal and Associates LLP, Advocates and Solicitors, India. SSRN, June 7, 2021. “IP Waiver during COVID Pandemic – Salvage or Apostacy ?” <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3861961> brett

In addition, neither are there news reports of any other critical drug used for Covid 19 treatment or their shortage nor about a patent related hurdle in the manufacture of any drug used for Covid 19 treatment. For argument’s sake, let us assume that many other patented drugs are being used for Covid -19, which is in short supply and there is no such voluntary license given by the patent owner. Then will this patent waiver help? The answer is simple, unlikely for a year or more. It will be impossible to reverse engineer and set the entire manufacturing process so quickly. If the present technology owner is not willing to support, it would not be easy to find a parallel process of creating the drug in a short duration. Procurement of the active ingredients and raw materials is another challenge. Getting the required approvals and thereafter manufacturing a drug is a time-consuming process. To launch a new drug requires certain safety protocols and clinical trials. A waiver of IP rights will not waive regulatory requirements for drug approvals. Hence, even if a new Indian manufacturer attempts to make a drug, it invariably may take minimum of two to three years. By a waiver of patents, no one can compel the existing manufacturer to share the know-how. So, a waiver of patents on drugs relating to Covid-19 may not give any immediate effect in sourcing drugs for managing Covid19.

#### Squo solves.

Crosby et al. 6-8, Daniel Crosby specializes in international trade, investment and matters related to public international law. A partner in our International Trade practice and the manager of our Geneva office, Daniel helps sovereign and business clients to achieve practical economic objectives around the world by applying and negotiating international agreements. JDSUPRA, June 8, 2021. “Update on the Proposed TRIPS Waiver at the WTO: Where is it Headed, and What to Expect?” <https://www.jdsupra.com/legalnews/update-on-the-proposed-trips-waiver-at-8411942/> brett

Proponents have advanced the proposed TRIPS waiver in the name of meeting global vaccine demand. But even in the absence of a waiver, pharmaceutical manufacturers have continued efforts to expand global production and distribution of COVID-19 vaccines and therapies, with a focus on expanding access to developing countries. For example, Pfizer announced its plan to deliver two billion doses to developing nations over the next 18 months, with one billion doses coming this year.8 One forecast estimates that, by the end of 2021, total global COVID-19 vaccine production may exceed 11 billion doses – an amount potentially sufficient to achieve global herd immunity.9

Several pharmaceutical industry groups have also proposed a five-step plan to “urgently advance COVID-19 equity,” including: (1) increasing dose sharing among countries through COVAX and other mechanisms; (2) optimizing production of vaccines and raw materials; (3) eliminating trade barriers for critical raw materials; (4) supporting country readiness to deploy vaccination programs; and (5) driving further innovation.10

Manufacturers have also continued to partner with other companies in efforts to scale up global production. For example, Moderna recently engaged Samsung Biologics to provide fill-and-finish manufacturing for Moderna’s vaccine.11 Merck and Gilead also each entered into or expanded voluntarily licensing programs with manufacturers in India to produce the companies’ respective COVID-19 antiviral agents molnupiravir and remdesivir.12

Some WTO members have also considered using the existing TRIPS flexibilities to expand their vaccine access. For example, Bolivia has continued to pursue its effort to import the Johnson & Johnson COVID-19 vaccine from Canadian company Biolyse Pharma, under a compulsory license pursuant to TRIPS Article 31bis (if one could be obtained).13

#### The issue is lack of resources, not IPR.

Brown 21, Delphine Knight Brown is a Partner in the firm’s Litigation Practice Group, and Intellectual Property Litigation Group. With over twenty years of trial experience, Delphine’s practice focuses on complex intellectual property and technology cases, with extensive experience in the life sciences industry. Freeborn Attorneys at Law, Summer 2021. “Will TRIPS Waiver of IP Protection for COVID-19 Vaccines Serve Global Need?” <https://www.freeborn.com/sites/default/files/downloads/Powerhouse%20Points_Newsletter_Summer%202021%20Final.pdf> brett

When the IP waiver concept was first proposed last October, Moderna agreed not to enforce its COVID-19 related patents during the pandemic. But despite Moderna’s voluntary waiver of its IP rights, no other company has stepped up to manufacture the Moderna vaccine. The most significant obstacle to COVID-19 vaccine supply is not just the IP rights that companies have obtained, or are pursuing, but rather the lack of raw materials and manufacturing facilities to produce the vaccines. Currently, there are shortages of raw materials and equipment used to make vaccines and biological products.

Unlike drug manufacturing, vaccine production processes are extremely complex and difficult to develop without support from current manufacturers. Additional manufacturers would need to have or acquire skilled expertise in mRNA technology and create or reconfigure manufacturing sites. Manufacturing vaccines requires additional processing steps and testing to assure quality and consistency. Manufacturing vaccines will also likely use the patented technology of other companies, who have not waived their IP rights. Investment in manufacturing is also an important piece of the solution. Whether existing companies can retool facilities and jump start manufacturing or new facilities need to be created through investment will be outcome determinative.

There is little doubt that the waiver proposals would at the very least up-end the existing incentives, including the prospect of future pharmaceutical innovation and development of products, that resulted in the rapid development and approval of COVID-19 vaccines. Moreover, the TRIPS waiver proposals may not have the desired effect of boosting COVID vaccine production and availability of mRNA vaccines. On the other hand, recent attempts at voluntary licensing and technology transfer agreements related to adenovirus vector technology have resulted in increased vaccine production and availability. A TRIPS waiver may not be as effective for more complex vaccine production.

Scaling up COVID-19 vaccine production is not a one-size-fits -all proposition. Ensuring equitable availability and delivery complicates the matter further.

#### New manufacturers trade off with current ones --- turns case because they won’t make vaccines as effectively.

Jonathan H. Spadt & Andrew J. Koopman 5-24, Jonathan H. Spadt is the Chief Executive Officer and President of RatnerPrestia. Andrew J. Koopman, J.D., Temple University Beasley School of Law (2008) Vice President, Intellectual Property Law Society Member, Intellectual Property Moot Court team Staff Writer, International and Comparative Law Journal B.S., Engineering Physics, Cornell University (2005) Minor in Electrical Engineering. 5-24-21, RatnerPrestia. “The “Moral” Waiver of IP Protection For COVID Vaccines: Why The US Proposal Creates More Problems Than It Solves” <https://www.ratnerprestia.com/2021/05/24/the-moral-waiver-of-ip-protection-for-covid-vaccines-why-the-us-proposal-creates-more-problems-than-it-solves/> brett

Not to be ignored in any discussion of short term effects is the potential impact a waiver would have on current vaccine manufacture. Like any product, the manufacture of vaccines is contingent on the availability of raw materials, which are not unlimited in supply. The waiver of IP rights would in principle substantially increase demand for these raw materials, resulting not only in higher prices but potential interference in the supply chain for established and proven vaccine manufacturers. There is no guarantee that manufacturers entering the market on the back of a TRIPS waiver would have the ability to produce vaccines with the quality and throughput of current suppliers.

#### A TRIPS waiver annihilates pandemic response through supply chain disruption, can’t solve, and decks innovation and investment—turns econ and covid response advs.

Pooley 5/21/21

The Big Secret Behind the Proposed TRIPS Waiver May 25, 2021 James Pooley is a former Deputy Director General of the World Intellectual Property Organization (WIPO). Jim has a private law practice in Silicon Valley where he specializes in trade secret litigation and counseling. For more than 40 years, Jim represented clients in high-stakes trade secret and patent disputes. His broad litigation experience, combined with his service as an international diplomat and business executive, make him uniquely qualified to serve as advisor, co-counsel, expert or ADR neutral (he is a panel member of FedArb) in trade secret disputes, and to consult with companies about trade secret management. https://www.ipwatchdog.com/2021/05/25/big-secret-behind-proposed-trips-waiver/id=133905////(\*ak)

All the fuss surrounding the proposal by India and South Africa to suspend the TRIPS Agreement to help them produce vaccines to fight COVID-19 has obscured some critical truths. In spite of the rallying cry “Patents versus People,” it’s not really about patents. And merely lifting TRIPS obligations will do nothing to address the current suffering of the world’s poorer populations. In fact, it would hamper efforts to secure global distribution of vaccines, as well as cause real harm in the long term. The Biden Administration has embraced the proposal in principle and has received plaudits for what many see as a humanitarian and diplomatic breakthrough: choosing people over patents. So how could something that looks so right be so wrong? First, we have to understand what the TRIPS Agreement is and isn’t. Stay with me here. I know that treaties can be boring, but this one is more important than you may realize. Since their introduction in 15th century Venice, patents have been strictly territorial, a grant of rights that stops at the country’s border. Indeed, if you found some invention being used in another country, you could bring it back home and get a patent even though you weren’t an inventor at all. We didn’t care much about what was going on next door, just what would benefit the local economy. Beginning in the late 19th century, as global commerce got seriously underway, a spate of treaties made it easier to claim inventions – and other intellectual property – in multiple countries. For patents, the high-water mark of this business-driven improvement came in 1978 with the Patent Cooperation Treaty (PCT), which bound all signatory countries to accept the priority date of an invention filed in another member country, so long as it was presented within 30 months. This is one of those international treaties that actually works in a practical way to speed the spread of innovation around the world. But still, patents and other IP protections are decided under national laws, and variations from one country to the next in the scope of rights – especially in enforcement – continued to cause a lot of inefficiency for companies trying to build global markets. So back in the early 1990s, when we all thought tariffs were bad and globalization was good, when everyone seemed to believe that a rising tide of cross-border commerce would lift all national economies, the United States led an effort to establish the agreement that would come to be known as TRIPS, for Trade-Related Aspects of Intellectual Property Rights. Here’s the thing to remember about TRIPS: it only creates obligations of governments to pass laws supporting intellectual property rights of various kinds: patents, copyrights, designs, trademarks, and trade secrets. It doesn’t affect the private ownership of those rights. That’s an important distinction, especially for trade secrets (or “undisclosed information” as it’s called in TRIPS), because unlike the other “registered” rights, it doesn’t depend on a government grant. It just requires a legal system that enforces confidentiality. The provisions of TRIPS were not new for industrialized countries. But for the developing world the agreement represented a tradeoff: adopt our framework for protecting IP (including our own, like drug patents), and you’ll get the benefit of increased wealth and productivity that comes with joining the club we’re going to call the World Trade Organization. What seemed to sell this deal was the expectation that “technology transfer” from industrial north to agricultural, extractive south would happen as a result. Remember that phrase “technology transfer,” because it’s at the hidden heart of the current waiver proposal. You see, published patents are available for anyone to read and learn from, and developing countries still have the option to compel licenses from patent owners if needed to address serious domestic needs, including pandemics. But patents are only a part of most stories of technology transfer, because in order to actually build the factory and produce the goods, you need to know more than what’s in the patents. When I managed the PCT in Geneva, I heard a lot about this from developing country delegates to WIPO. They expressed great disappointment in how TRIPS seemed to be a “bait and switch” scam, in which the promised benefit never materialized. Patents are fine, but that doesn’t tell you how to adjust the dials on the machines to get the best outcomes. They thought they would be getting all that “know-how,” too. For some traditional pharmaceuticals, this lack of know-how may not be a showstopper. The patent claims may describe a particular small molecule that provides a certain therapeutic effect. If you already know how to make pills, then manufacturing it can sometimes be relatively straightforward. Sometimes, but not always. Moreover, biopharma generally, and mRNA vaccine technology in particular, are quite different from traditional drugs. Developing a process to reliably produce these medications at scale is astonishingly difficult and depends on years of experimentation involving cell growth times, temperatures, and other variables. That body of knowledge represents the trade secrets of the developers. It is enormously valuable, and not just for making COVID-19 vaccines. Creating other therapeutics based on the mRNA platform would be much easier and quicker with the benefit of knowing what tends to work and what doesn’t. So, this is why a temporary waiver of TRIPS—which would suspend national obligations to enforce IP rights—can’t possibly help countries like India get more vaccines to its citizens. The know-how required to manufacture at scale is owned by the companies like Pfizer and Moderna that are producing doses in record volumes. To effect the demanded “technology transfer,” governments would have to secure the agreement of those companies not just to hand over their entire “cookbook” but also to send qualified scientists and technicians to spend time at the foreign facilities, basically consulting on how to implement the secret processes to produce a safe vaccine. And even if that transfer happened tomorrow, getting to the point of actually manufacturing in volume would take more than a year. Not only would the TRIPS waiver not produce the results the proponents want, it would likely reduce the current level of international distribution of vaccines, by interfering with access to the limited supplies of required ingredients. In fact, this supply chain disruption was recently cited by none other than the government of India in pushing back against popular demands for a compulsory license on Gilead’s Remdesivir and other COVID-19 treatments, noting that the “main constraint” was not intellectual property rights but preventing competition for scarce “raw materials and other essential inputs.” But there’s more. A waiver would result in even greater harm over the long haul. Drugs typically are not discovered by governments. Instead, we rely on the private sector to respond to new diseases. It seems deeply ironic that while our IP system succeeded in incentivizing the development of a new vaccine only months after the SARS CoV-2 virus appeared, we would now be considering suspending that system. Congratulations and thank you! Now, hand over your trade secrets! Another irony relates to the fact that these companies have not been producing all the vaccine on their own. Instead, they planned ahead and established collaborative relationships with other manufacturers, leading to quick and effective voluntary technology transfers through licensing. Those who clamor for a waiver seem to ignore that robust, reliable trade secret laws enable such transactions. It may seem counterintuitive, but it’s well established that enforceable secrecy leads to more dissemination of technology, not less. Indeed, without it there would be hoarding of know-how, slowing production of vital medications and other innovations. It takes more than $1 billion to engage in the risky business of producing a new drug. The willingness of shareholders to invest that kind of money requires a predictable IP system, one in which rights are not imperiled just because some people mistakenly believe those rights are in the way of achieving some laudable goal. Broadly removing IP protections is something governments can do, but they can only do it once, because the next time there may be no innovations available to claw back. Without reliable incentives, private industry simply won’t be able to prepare us for the next pandemic. Trying to suspend IP rights clearly will not solve the problem and, indeed, risks making it worse. Instead, the international community – including the United States – should focus on diplomatic solutions to the immediate problem by lifting export controls by rich countries and forcing more equitable distribution of the available supplies of vaccines. For decades, the United States has been vigorously promoting the value to society of a strong, globally harmonized IP system. The success of Operation Warp Speed has demonstrated the value of that system. This is no time to see what it might be like without one.

#### Pharmaceutical companies have retaliated in the past when IPR has been eased.

Lazare and Guerrero 21 [Sarah, editor and reporter, journalist, In These Times, "Big Pharma Is Deciding Who Lives and Who Dies in the Global South The chilling effect of the pharmaceutical industry’s veiled threats." July 22, https://inthesetimes.com/article/pfizer-pharmaceutical-companies-covid-pandemic-coronavirus-latin-america-trips-waiver-vaccines

This would not be the first time the pharmaceutical industry has retaliated against countries. In 2007, the U.S.-based Abbott Laboratories refused to supply Thailand with a new HIV treatment in response to the country’s decision to override patent rules on three drugs the company produces, including a cheaper, generic version of the HIV treatment Kaletra. Abbott deliberately withheld a new heat-stable version of Kaletra, which is best suited for countries with hot, muggy climates, and the company was explicit about its punitive intent. ​“This is a consequence, directly, of the Thai government’s decision not to support innovation by breaking the patents of numerous medicines,” said Dirk van Eeden, director for Abbott’s public affairs, according to a 2007 article in Financial Times. (A few weeks later, Abbott reversed its decisions following global outcry.) But one can look to more recent history to find other forms of industry retaliation. As journalist Lee Fang reported in March, pharmaceutical industry trade groups pressured the Biden administration to impose sanctions on Hungary, Chile and Colombia for their efforts to override patent rules in a bid to improve access to Covid-19 vaccines. This kind of retaliation is not new or unique to the Covid-19 pandemic. Pharmaceutical companies and American lawmakers have threatened India with sanctions for its production of a cheaper version of a cancer drug, and threatened Malaysia with sanctions for its use of a cheaper version of a Hepatitis C drug. Such actions can have a chilling effect. ​“As a result of these and other instances, countries have, understandably, been reluctant to develop more flexible domestic [compulsory licensing] policies and are certainly out of practice in using them,” writes Rachel Thrasher, research fellow at the Global Development Policy Center.

#### If IPR is eased for COVID-19 vaccines, companies are threatening to not develop vaccines in the future

Lazare and Guerrero 21 [Sarah, editor and reporter, journalist, In These Times, "Big Pharma Is Deciding Who Lives and Who Dies in the Global South The chilling effect of the pharmaceutical industry’s veiled threats." July 22, https://inthesetimes.com/article/pfizer-pharmaceutical-companies-covid-pandemic-coronavirus-latin-america-trips-waiver-vaccines

Pharmaceutical companies and trade groups steer clear of public threats to retaliate for TRIPS waiver support. But industry trade groups are warning that if patent rules are suspended, companies may decide not to pursue research and development for vaccines in the future — a wholly different kind of threat. (In reality, publicly-funded research has been essential to the production of Covid-19 vaccines.) Meanwhile, pharmaceutical companies have other avenues for exerting pressure. Madlen Davies, Rosa Furneaux, Jill Langlois and Iván Ruiz reported for the Bureau of Investigative Journalism in February that ​“Pfizer has been accused of ​‘bullying’ Latin American governments in Covid vaccine negotiations and has asked some countries to put up sovereign assets, such as embassy buildings and military bases, as a guarantee against the cost of any future legal cases.”

#### IPR is not the cause of medicine inequality. Multiple alternative causes exist

Haugen 21 [Hans Morten, Professor of International Diakonia at the VID Specialized University, Oslo, Norway, The Journal of World Intellectual Property, "Does TRIPS (Agreement on Trade-Related Aspects of Intellectual Property Rights) prevent COVID-19 vaccines as a global public good?" March 18, https://onlinelibrary.wiley.com/doi/10.1111/jwip.12187

This article analyzes the context for the allegation that IP is among the crucial factors in promoting health innovation globally, and not preventing the universal and equitable access to vaccines, even if supply of medicines is held by developed countries to be “difficult” (WTO Secretariat, 2020a). Biotechnology actors expressed criticism of the UN High-level Panel on Access to Medicines (2016), arguing that IP tends to be overemphasized in debates over access to medicines, ignoring the wider context of what impedes such access (International Council of Biotech Associations [ICBA], 2016; Biotechnology Innovation Organization [BIO], 2016). Hence, developed countries and biotech associations concur in identifying weak funding of health care and lack of manufacturing capacity as constituting the core of the problem of access (WTO Secretariat, 2020a; see also U.S. Department of State, 2016), as well as regulatory inefficiencies, trade policies and inadequate health insurance (ICBA, 2016).