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#### CP: States should mandate companies substantially increase workplace diversity

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#### The Euro is on the brink – its collapse is not inevitable, but likely if trends continue

Kern 20 [Soeren Kern is a Distinguished Senior Fellow of the Gatestone Institute, and the Senior Analyst for Transatlantic Relations at the Madrid-based [Grupo de Estudios Estratégicos](http://www.gees.org/) / Strategic Studies Group. A political scientist by training, Soeren specializes in European politics as well as US and European defense- and security-related issues. April, 2020. “Coronavirus: The Looming Collapse of Europe’s Single Currency” [https://www.gatestoneinstitute.org/15856/coronavirus-euro-collapse Accessed 8/23/21](https://www.gatestoneinstitute.org/15856/coronavirus-euro-collapse%20Accessed%208/23/21) //gord0]

In Spain, which recently overtook Italy as the epicenter of the coronavirus in Europe, Prime Minister Pedro Sánchez committed €200 billion — 20% of the country's GDP — to alleviate the economic and social consequences of the pandemic. When asked how he would pay for that amount of spending, Sánchez replied that he was counting on financial help from "Europe." "The worst growth figure in France since 1945 was in 2009, after the great financial crisis of 2008: -2.2%. We will probably be far beyond -2.2% this year," Le Maire told the Senate Economic Affairs Committee. "This shows the extent of the economic shock we are facing." — French Finance Minister Bruno Le Maire, April 6, 2020. "Today, not a single European country is doing well, which means there is limited willingness for European countries to come to each other's aid. They are busy dealing with their own crises. Just witness how Italy has been left alone with its crisis by Europe and now rather gets its medical support from China...." — Oliver Hartwich, Executive Director, The New Zealand Initiative, March 23, 2020. "An almighty economic earthquake is in the making. In a few weeks or months, several large European economies will require bailout and assistance packages. These will be several times larger than anything Europe has seen. Yet no country, central bank or institution will be eager or even able to provide them. Even the gargantuan sums on the table now will not be enough." — Oliver Hartwich, Executive Director of The New Zealand Initiative, March 23, 2020 As the coronavirus unleashes economic shockwaves across Europe, the European single currency, the most visible symbol of European unification, is facing collapse. The eurozone — a monetary union of 19 of the 27 Member States of the European Union that have adopted the euro as their common currency — is being buffeted not only by the prospect of a deep and long-lasting recession. Northern and Southern European countries are also feuding over possible financial support for Italy and Spain, the EU's third- and fourth-largest economies, which have been especially hard hit by the coronavirus. On March 13, European Central Bank (ECB) President Christine Lagarde [dismissed](https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.mp200312~8d3aec3ff2.en.html) calls by Italy for financial assistance to help it cope with the pandemic. After her comments rattled financial markets, Lagarde quickly reversed course and [said](https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.mp200312~8d3aec3ff2.en.html) that the ECB was "fully committed to avoid any fragmentation in a difficult moment for the euro area." Italian President Sergio Mattarella [replied](https://www.reuters.com/article/us-ecb-policy-italy-minister/italy-furious-at-ecbs-lagarde-not-here-to-close-spreads-comment-idUSKBN20Z3DW) that Italy had a right to expect solidarity from beyond its borders rather than obstacles. On March 18, the ECB [announced](https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200318_1~3949d6f266.en.html) that, in an effort to calm sovereign debt markets, it would spend €750 billion ($810 billion) to purchase bonds issued by national governments. Lagarde [tweeted](https://twitter.com/lagarde/status/1240414918966480896): "Extraordinary times require extraordinary action. There are no limits to our commitment to the euro." Larry Elliott, Economics Editor of the *Guardian* newspaper, [wrote](https://www.theguardian.com/world/2020/mar/19/ecb-u-turn-shows-it-fears-coronavirus-could-destroy-eurozone-project) that the ECB's announcement was evidence that, without a massive support package, the eurozone was in danger of collapse: "The situation is immensely more dangerous — both economically and politically — than it was when spiraling Italian and Spanish bond yields prompted Mario Draghi's [President of the European Central Bank between 2011 and 2019] "whatever it takes speech" in 2012. With people dying in their thousands, borders closing and activity collapsing, the entire European project is at risk." On March 26, EU leaders, during a virtual summit held by video conference, were [unable to agree](https://www.euractiv.com/section/economy-jobs/news/leaders-clash-over-stimulus-against-pandemic-pass-the-hot-potato-to-the-eurogroup/) on an economic response to the coronavirus. A day earlier, nine eurozone countries — Belgium, France, Greece, Ireland, Italy, Luxembourg, Portugal, Slovenia and Spain — [called](https://www.euractiv.com/section/economy-jobs/news/nine-member-states-ask-for-eurobonds-to-face-coronavirus-crisis/) for a common debt instrument, called "coronabonds," to mitigate the damage caused by the coronavirus crisis. "We are all facing a symmetric external shock, for which no country bears responsibility, but whose negative consequences are endured by all," they said in a letter.

#### IPR is critical in influencing the EU’s economic output

EUIPO 20 [European Union Intellectual Property Office. June, 2020. “2020 status report on IPR infringement” ask me for the pdf. Accessed 8/23/21 //gord0]

The economic value of European IPR-intensive industries has grown during the financial crisis that began in 2008 (2). In 2019, the EUIPO, together with the EPO, estimated that in 2014-2016 these industries accounted for 45 % of the EU’s economic output (EUR 6.6 trillion annually) and 29 % of employment (3). Both figures are higher than those in the earlier IP Contribution study published in 2016 and indicate that IPR-intensive industries are more resilient during adverse economic conditions than other sectors. Figure 1 illustrates the importance of IPRs by defining the proportion of EU GDP generated by IPR- intensive industries for each of the six IPRs included in the study. Trade marks represent the highest share of the total EU GDP as most businesses that sell products and services need to identify their offerings and distinguish them from those of competitors. Trade marks are therefore an essential feature of a market economy. In terms of contribution to GDP, trade marks are followed by designs, patents and copyright. The other IPRs included in the study are Geographical Indications (GI) and Plant Variety Rights (PVR). Figure 1 – Contribution of IPR-intensive industries to EU GDP, 2014-2016 average. Sectors which make above-average use of IPR exhibit a collective trade surplus with countries outside of the EU. This surplus of EUR 182 billion counterbalanced a small deficit in non-IPR-intensive trade, resulting in an overall trade surplus for the EU of EUR 166 billion. With 45 % of EU GDP (value added) and 29 % of employment being generated by IPR-intensive industries, the implication is that value added per employee in IPR-intensive industries must be higher than in the rest of the economy. This, in turn, enables companies in those sectors to offer their workers higher remuneration than the non-IPR-intensive sectors, as shown in Figure 2. Overall, remuneration in IPR- intensive industries was 47 % higher than in other sectors. This positive differential holds across all five IPRs for which the calculation was made. Figure 2: Average remuneration in IPR-intensive industries compared to non-IPR-intensive industries, 2016 \*Data for wages in agriculture are not available in sufficient detail to be able to calculate the wage premium for PVR-intensive industries. Source: EPO/EUIPO (2019) – IPR-intensive industries and economic performance in the European Union. To gain a greater understanding of the microeconomic dynamics underpinning these aggregates, the EUIPO examined the relationship between IPR ownership and company performance, and published in June 2015 the resulting report, Intellectual property rights and firm performance in Europe: an economic analysis (4). By combining financial performance data with data from the EUIPO’s and EPO’s registers, a comparison was made between companies owning IPRs and those without. That study found that IPR- owning companies tended to employ more workers and generated on average 29 % higher revenue per employee than firms without IPRs. The analysis of company size, business performance and IPRs revealed that this relationship was particularly pronounced for SMEs. These companies generated almost 32 % higher revenue per employee than SMEs that did not own IPRs. The studies described above are static in nature: they investigate the relationship between IP rights and economic performance (whether at the level of industry or individual companies) at a given point in time. To address this, a new study carried out by the EUIPO and the EPO in 2019 (5) looked at the relationship between SMEs’ IPR activity and their growth in subsequent years. This study showed that SMEs that apply for patents, trade marks or designs have a higher probability than other SMEs of achieving high-growth status during the subsequent 3 years (6). Furthermore, this effect was strongest for the SMEs that had applied for European rather than only national IP rights, indicating the importance of international activities for the high growth of the firm. Also, firms that used more than one type of IPR had a greater likelihood of achieving high growth, as shown in Figure 3. SMEs that apply for trade marks only have a 10 % greater likelihood of subsequent high growth than SMEs that are not IPR active. However, if patents are also used, the likelihood of high growth is 16 % higher than for non-users; combinations of trade marks and designs increase the likelihood of high growth by 27 %, and combinations of all three IP rights, by 33 %. Figure 3: Prior use of IP rights and the probability of subsequent high growth. The finding that IPR-owning SMEs perform well and yet only a small minority of SMEs register IPRs led the EUIPO to examine in more detail the use of IPRs by European SMEs: why do they register those rights (or refrain from doing so), what kind of problems do they face when trying to protect their rights, and what kind of impact did IPRs have on their business. The results were released through the EUIPO’s 2019 IP SME Scoreboard (7), an update of the earlier study from 2016. The main reasons that IPR-owning SMEs gave for registering IPRs were: to prevent copying (59 %), to increase legal certainty (58 %) and to improve the image and value of the company (36 %). After registration, 54 % of owners claimed a positive impact. The main impacts identified were an increase in reputation (52 %), turnover (39 %) and ability to access new markets (37 %). For those without registered IPRs, the main reason for not registering was a lack of knowledge about what IP is and its benefits. The percentage giving this reason has increased from 25 % in 2016 to 38 % in 2019. Despite this positive impact on commercial performance, many SMEs still believe that they lack sufficient knowledge about IPRs and their impact and that registration and enforcement is too lengthy and too costly. About 24 % of the respondents reported having suffered from IPR infringement, down from 31 % 3 years earlier.

#### Euro collapse ensures Eurozone destruction and a ripple effect globally.

Phillips 10 [Julian Phillips is the Founding Partner of Gold Forecaster - Global Watch and Silver Forecaster [incorporating Platinum]. Mr. Phillips analyzes the gold, silver, and platinum market alongside the macro economic currency aspects of these precious metals. April 30, 2010. “What will Happen to Currencies if the Euro Collapses?” [https://www.gold-eagle.com/article/what-will-happen-currencies-if-euro-collapses Accessed 8/23/21](https://www.gold-eagle.com/article/what-will-happen-currencies-if-euro-collapses%20Accessed%208/23/21) //gord0]

Let us start off by saying that we do not see the Euro collapsing and being shelved, at least not yet, anyway. No exit process was written into their rules anyway. But it is technically possible, so better to be forewarned. What would prompt such a collapse? The future of the Euro lies in the hands of its members, especially Germany - the richest and strongest member of the Eurozone. It would be because the leading member [Germany]) felt it to be in their national interest(s) to let it fall. There would be absolutely no philanthropy in the process should anybody exit or if the Euro disappeared. Principally, would Germany, et al, gain more by leaving the Eurozone than staying in it? It may be more in their interests to have the poorer nations ejected from the Eurozone to keep the big benefits and to lose the problems. Then they would hold onto the Euro. But what would any of these possibilities result in? Full Collapse Simply put, the Eurozone would revert to what it was before the Euro existed. The European Central Bank would have to return all of its gold to the member States in proportion to their initial contributions. Their old currencies would have to be resurrected and Euro reserves converted back to the mix passed to the European Central banks from the beginning of the Eurozone. Dollar & [or if by then the Yuan was internationalized] Yuan reserves would be built up again to replace the lost Euro reserves. The world's Foreign Exchange Markets would be in chaos. Confidence in most if not all currencies would almost disappear. By extension the ripple effect through the economies of the world and business in general, would be destructive. There would be a huge scramble for all hard assets, but particularly precious metals. Briefly the U.S. Dollar would reign as king. Partial Collapse More likely the Eurozone will shrink first. The poorer Southern countries of the E.U. would be cast out of the Eurozone and would have to revert to their previous currencies. Spain would return to the Peseta, Greece to the Drachma, etc. The example of Argentina un-pegging from the U.S. Dollar should be seen as the precedent for this process. The wealthy of Argentina found their capital hammered when it was forcefully converted from the U.S. Dollar to the Peso in that process too. So the lifting of deposits, which is happening now, from the banks in Greece, Portugal and now Spain, was only to be expected. If they had their own currencies, either the fall in the value of those currencies would deter that capital flight, or the imposition of Exchange Controls would block it. In the case of Europe, we would also expect to see Exchange Controls imposed immediately all countries that leave the Eurozone did so. This would prevent the capital hemorrhaging from the country that left the Eurozone in disgrace. The exchange rate of the exiting countries would initially fall heavily then take a long time to recover, if they managed to recover economically at all. By leaving the zone, these countries, would ensure they would suffer at least one, if not more, decades of growing poverty, much as is expected to happen with them remaining inside the Eurozone. With the richer nations remaining in the Euro, the exchange rate of the Euro would soar at first, hammering its global trade competitiveness but attracting the world's capital. It would jump against all currencies, but most decisively against the U.S. Dollar, as its indebtedness would fall and prospects would improve. If Germany Leaves The Eurozone It is possible in one scene to see Germany recognizing no further advantage of remaining in the E.U. and opting to leave. This is unlikely, but technically possible. If it were to do so, there would be few really strong economies left behind, in the zone. This would be a disaster for the Euro, which would tumble against the U.S. Dollar. If the poor countries of the Southern part of the Eurozone remained in the E.U., then the Euro would remain on an ever deteriorating slope. Germany would return to the Deutschmark and follow a similar currency path that it experienced prior to the creation of the Euro. This would mean repeated upward revaluations, usually preceded by denials of such revaluations from the Bundesbank. In that event, the U.S. Dollar would be favored as the global reserve currency almost exclusively and would rise on foreign exchanges, despite so many reasons why it should fall. It would in fact be falling but slower than other important currencies, giving the impression of strength in weakness. This is until the full international appearance of the Yuan. Globally Resource producing currencies would soar. In an attempt to lower their exchange rates they would turn to lowering their interest rates in the hope of maintaining the export competitiveness of their locally manufactured goods. With resources having an international market price, outside their own currency, such nations would drive down their exchange rates, provided local inflation allowed it [As China is doing now and as was suggested by the I.M.F. recently]. The overall result would be a volatile and damaging use of currencies as part of trade wars. Should that happen, Protectionism and Exchange Controls would become commonplace, particularly in smaller economies. As China grows in international importance over the next decade, we believe that the Yuan would quickly become of equal importance to the U.S. Dollar and move into center stage as a global reserve currency. This would accompany pricing of goods [imports] in Yuan and exports from China in the currency of each importer's currencies. We believe China is very aware of this and has made plans for the Yuan to internationalize. With Foreign Exchanges becoming increasingly volatile, confidence mercurial and uncertainty hanging over both the present and the future, assets, particularly internationally-mobile assets, such as precious metals would be increasingly sought after as a counter to all currencies.

**Interdependence generates tension and goes nuclear**

**Tønnesson 15** [(Stein, Research Professor, Peace Research Institute Oslo; Leader of East Asia Peace program, Uppsala University) “Deterrence, interdependence and Sino–US peace,” International Area Studies Review, Vol. 18, No. 3, p. 297-311, 2015] SJDI

Several **recent works** on China and Sino–US relations **have made** substantial **contributions to the current understanding of how and under what circumstances** a combination of **nuclear deterrence and economic interdependence may reduce the risk of war between major powers**. At least four conclusions can be drawn from the review above: first, those who say that **interdependence may both inhibit and drive conflict** are right. **Interdependence raises the cost of conflict** for all sides **but** **asymmetrical or unbalanced dependencies and negative trade expectations** may **generate tensions leading to trade wars among inter-dependent states that** in turn **increase the risk of military conflict** (Copeland, 2015: 1, 14, 437; Roach, 2014). The risk may increase if one of the interdependent countries is governed by an inward-looking socio-economic coalition (Solingen, 2015); second, the risk of war between China and the US should not just be analysed bilaterally but include their allies and partners. Third party countries could drag China or the US into confrontation; third, in this context it is of some comfort that the three main economic powers in Northeast Asia (China, Japan and South Korea) are all deeply integrated economically through production networks within a global system of trade and finance (Ravenhill, 2014; Yoshimatsu, 2014: 576); and fourth, **decisions for war** and peace **are taken by very few people, who act on the basis of their future expectations**. International relations theory must be supplemented by foreign policy analysis in order to assess the value attributed by national decision-makers to economic development and their assessments of risks and opportunities. **If leaders** on either side of the Atlantic **begin to seriously fear or anticipate their own nation’s decline** then **they may blame** this on **external dependence, appeal to anti-foreign sentiments, contemplate the use of force to gain** respect or **credibility, adopt protectionist policies, and** ultimately **refuse to be deterred by** either **nuclear arms or prospects of socioeconomic calamities. Such a dangerous shift could happen abruptly**, i.e. under the instigation of actions by a third party – or against a third party.

Yet as long as there is both nuclear deterrence and interdependence, the tensions **in East Asia** are unlikely to escalate to war. As Chan (2013) says, all states in the region are aware that they cannot count on support from either China or the US if they make provocative moves. **The greatest risk is not** that **a territorial dispute** leads to war under present circumstances **but that changes in the world economy alter those circumstances in ways that render inter-state peace more precarious**. If China and the US fail to rebalance their financial and trading relations (Roach, 2014) then a trade war could result, interrupting transnational production networks, provoking social distress, and exacerbating nationalist emotions. **This could have unforeseen consequences in the field of security, with nuclear deterrence remaining the only factor to protect the world from Armageddon, and unreliably so**. **Deterrence could lose its credibility**: one of the two **great powers might gamble that the other yield in a cyber-war or conventional** limited **war**, or third party countries might engage in conflict with each other, with a view to obliging Washington or Beijing to intervene.

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#### Biotech is the new frontier; America is ahead but China is dangerously close

Gupta 6/11 [Gaurav Gupta, Biotech Investor, Founder of Ascendant BioCapital, a life science investment firm based in New York. Previously, Gaurav worked at OrbiMed Advisors, and served as a resident in neurological surgery at Columbia University Medical Center. He has co-authored over a dozen articles in peer-reviewed journals, filed a patent on a device for use in spine surgery, and edited a book on the technical and ethical implications of using tissue engineered products in the operating room. Dr. Gupta obtained his M.D. from the Stanford University School of Medicine, where he was a Paul and Daisy Soros Fellow, and B.S. and M.S.E. in biomedical engineering from Johns Hopkins University, where he was a Charles R. Westgate Scholar.) “As Washington Ties Pharma’s Hands, China Is Leaping Ahead” Barron’s Magazine: Commentary, China., 6/11/2021] RM

There should be no doubt that we are living at the dawn of a golden age of biomedical innovation. The American scientific engine that produced Covid-19 vaccines in record time was fueled by a convergence of advances in genomics, biomarkers, data science, and manufacturing years in the making. The first Food and Drug Administration approvals of a host of new product formats—oligonucleotide, bispecific, oncolytic virus, CAR-T, and lentivirus/AAV—all took place within the last decade. These represent an unprecedented expansion of the armamentarium that physicians have at their disposal to treat and cure disease. In the last few years, [47% of all new medicines](https://www.efpia.eu/media/554521/efpia_pharmafigures_2020_web.pdf) were invented by U.S. biopharma companies, with [homegrown startups](https://www.cbo.gov/publication/57126) driving the majority of innovation. The bulk of the remainder were developed by foreign companies specifically for the U.S. market.

An indirect benefit of these trends is that most novel therapeutics undergo clinical development and early commercial launch here in the U.S. The rest of the world understands that the American patient has earlier and broader access to groundbreaking therapies via these mechanisms. Indeed, the past decade is filled with examples of medical “firsts” for American patients: the first cure for Hepatitis C, the first gene therapy for blindness, the first immunotherapy for cancer. Future rewards will be greater still if we preserve our current system of incentivizing and protecting innovation.

The remarkable innovation capacity of our biopharmaceutical industry ought to be a source of national pride. Yet while “Made in America” is the global standard for medicines in development today, misguided policy risks ceding our scientific prowess to other countries in the future. This is particularly true in the case of China, where biotechnology has become a strategic pillar for the health of its people and economy.

From 2016 to 2020, the market capitalization of all Chinese biopharma companies increased exponentially from [$1 billion to over $200 billion](https://www.bloomberg.com/news/articles/2021-03-01/xi-mobilizes-china-for-tech-revolution-to-cut-dependence-on-west). China saw over [$28 billion](https://www.bioworld.com/articles/506978-china-sees-five-year-highs-in-life-sciences-investments-and-partnering) invested in its life sciences sector in 2020, double the previous year’s amount. Returns on China’s investment are already arriving. The FDA approved a drug developed in China for the first time ever in 2019. While China’s innovation capacity currently remains behind America’s, my experiences as a biopharma professional make it clear they are doing everything they can to catch up and catch up fast.

In fact, when I speak to Chinese biotechnology executives, they boast that they can run clinical trials faster than their U.S. counterparts. The danger of misguided policies that disincentivize pharmaceutical innovation in the U.S. is effectively driving that same innovation to China. If we close off the market in the U.S. at the same time that China is opening its market to innovative new products, then we will see companies choose to first launch impactful novel medicines in China, based on clinical trials conducted in China. Because the FDA rarely accepts data generated entirely outside the U.S., this relocation of research capacity will negatively affect Americans’ access to cutting-edge therapies.

The biotechnology field is advancing rapidly. Promising technologies such as targeted protein degradation and gene editing are perhaps not far from being developed into impactful medicines, and the U.S. risks these technologies being mastered by Chinese companies.

It is widely held that allowing China to gain an asymmetric edge in critical technologies such as AI or quantum computing could destabilize the geopolitical balance of power. The same is true of biotechnology. Chinese scientists were the first to edit the genomes of human embryos, in [contravention](https://www.sciencemag.org/news/2019/12/chinese-scientist-who-produced-genetically-altered-babies-sentenced-3-years-jail) of international standards, and the U.S. national security community believes China is [pushing ahead](https://www.nbcnews.com/politics/national-security/china-has-done-human-testing-create-biologically-enhanced-super-soldiers-n1249914) with experimental concepts for biological and cognitive enhancement of soldiers and civilians. American policy should be focused on protecting, rather than undermining, the global dominance of our biotechnology industry.

#### The plan recapitulates IP to China, destroying competitive advantages

WSJ 5/6 [Wall Street Journal Editorial Board, WSJ Opinion Philosophy: “We speak for free markets and free people, the principles, if you will, marked in the watershed year of 1776 by Thomas Jefferson's Declaration of Independence and Adam Smith's “Wealth of Nations.” So over the past century and into the next, the Journal stands for free trade and sound money; against confiscatory taxation and the ukases of kings and other collectivists; and for individual autonomy against dictators, bullies and even the tempers of momentary majorities.” Edited by Paul A. Gigot and Daniel Henninger, “Biden’s Vaccine IP Debacle: His patent heist is a blow to the Covid fight and U.S. biotech.” The WSJ Opinion: Review and Outlook, May 6, 2021] RM

We’ve already criticized President Biden’s bewildering decision Wednesday to endorse a patent waiver for Covid vaccines and therapies. But upon more reflection this may be the single worst presidential economic decision since Nixon’s wage-and-price controls.

In one fell swoop he has destroyed tens of billions of dollars in U.S. intellectual property, set a destructive precedent that will reduce pharmaceutical investment, and surrendered America’s advantage in biotech, a key growth industry of the future. Handed an American triumph of innovation and a great soft-power opportunity, Mr. Biden throws it all away.

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India and South Africa have been pushing to suspend patents at the World Trade Organization for months. They claim that waiving IP protections for Covid vaccines and therapies is necessary to expand global access, but their motivation is patently self-interested.

Both are large producers of generic drugs, though they have less expertise and capacity to make complex biologics like mRNA vaccines. They want to force Western pharmaceutical companies to hand over IP free of charge so they can produce and export vaccines and therapies for profit. Their strategy has been to shame Western leaders into surrendering with the help of Democrats in the U.S.

But suspending IP isn’t necessary to expand supply and will impede safe vaccine production. The global vaccine supply is already increasing rapidly thanks to licensing agreements the vaccine makers have made with manufacturers around the world.

Pfizer and BioNTech this week said they aimed to deliver three billion doses this year, up from last summer’s 1.2 billion estimate. Moderna increased its supply forecast for this year to between 800 million and a billion from 600 million. AstraZeneca says it has built a supply network with 25 manufacturing organizations in 15 countries to produce three billion doses this year.

AstraZeneca and Novavax have leaned heavily on manufacturers in India to produce billions of doses reserved for lower-income countries. But India has restricted vaccine exports to supply its own population. IP simply isn’t restraining vaccine production.

Busting patents also won’t speed up production, since it would take months for these countries to set up new facilities. Competition will increase for scarce ingredients, and less efficient manufacturers with little expertise would make it harder for licensed partners to produce vaccines.

There’s also the problem of safety. Johnson & Johnson has experienced quality problems at an Emergent plant making its vaccines, and that’s in Baltimore. Imagine the potential problems with unlicensed producers in, say, Malaysia or Brazil. If vaccines made there have complications, confidence in licensed vaccines could plummet too. And who would Pfizer and Moderna sue to get their reputations back?

The economic self-damage is also hard to fathom. The U.S. currently has a competitive advantage in biotech and biologics manufacturing, which could be a growing export industry. Waiving IP protections for Covid vaccines and medicines will give away America’s crown pharmaceutical jewels and make the U.S. and world more reliant on India and China for pharmaceuticals.

Moderna has been working on mRNA vaccines for a decade. Covid represents its first success. Ditto for Novavax, which has been at it for three decades. Small biotech companies in the U.S. have been studying how to create vaccines using nasal sprays, pills and patches.

Thanks to Mr. Biden, all this could become the property of foreign governments. Licensing agreements allow developers to share their IP while maintaining quality control. Breaking patents and forcing tech transfers will enable China and low-income countries to manufacture U.S. biotech products on their own.

China’s current crop of vaccines are far less effective than those in the West, but soon Beijing might be able to purvey Pfizer knock-offs. The U.S. has spent years deploring China’s theft of American IP, and now the Biden Administration may voluntarily let China could reap profits from decades of American innovation.

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Instead of handing over American IP to the world, Mr. Biden could negotiate bilateral vaccine agreements and export excess U.S. supply. If Mr. Biden wants to increase global supply safely, the U.S. could spend more to help the companies produce more for export. Then the jobs would go to Americans. We thought this was the point of the production deal Mr. Biden negotiated between J&J and Merck.

Alas, this President seems to be paying more attention these days to Elizabeth Warren, Bernie Sanders, Alexandria Ocasio-Cortez and Nancy Pelosi. They think vaccines and new drugs can be conjured by government as a public good with no incentive for risk-taking or profit. This really is destructive socialism.

Mr. Biden ought to listen to Angela Merkel. Pfizer’s partner BioNTech is a German firm, and the German Chancellor said Thursday that she opposes the WTO heist: “The protection of intellectual property is a source of innovation and it must remain so in the future.”

At least IP is safe in Germany. Mr. Biden has sent a signal around the world that nobody’s intellectual property is safe in America.

#### China will leapfrog the US through biotech primacy

Cumbers 20 [John Cumbers, “I am the founder and CEO of SynBioBeta, the leading community of innovators, investors, engineers, and thinkers who share a passion for using synthetic biology to build a better, more sustainable universe. I publish the weekly SynBioBeta Digest, host the SynBioBeta Podcast, and wrote “What’s Your Biostrategy?”, the first book to anticipate how synthetic biology is going to disrupt virtually every industry in the world. I also founded BetaSpace, a space settlement innovation network and community of visionaries, technologists, and investors accelerating the industries needed to sustain human life here and off-planet. I’ve been involved with multiple startups, I am an operating partner and investor at the hard tech investment fund Data Collective, and I'm a former bioengineer at NASA. I earned my PhD in Molecular Biology, Cell Biology, and Biochemistry from Brown University and am originally from the UK.”) “China’s Plan To Beat The U.S. In The Trillion-Dollar Global Bioeconomy” Forbes, 2/3/2020] RM

The report, entitled “Safeguarding the Bioeconomy,” looks at how research and innovation in the life sciences is driving rapid growth in agriculture, biomedical science, information science and computing, energy, and other sectors of the U.S. economy. This economic activity—collectively referred to as the bioeconomy—presents many opportunities to create jobs, improve the quality of life, and continue to drive the U.S. economy as a whole.

The report says that while the U.S. has been a leader in advancements in the biological sciences, other countries are actively investing in and expanding their capabilities in this area—and the U.S.’s lead is beginning to slip.

Four reasons everyone should care about the U.S. bioeconomy

It might be easy for some to dismiss the report out of hand as a bunch of alarmist professors lobbying for more research money. But when you consider all the ways that biotechnology powers the economy and impacts our daily lives, it becomes clear that this is about something more:

The economy: at $1 trillion in value, the U.S. bioeconomy represents hundreds of thousands of quality, high-paying jobs for Americans.

Health & medicine: innovators in the bioeconomy are making next-generation therapies for cancer and diabetes, tackling emerging diseases like Coronavirus, and even increasing human longevity.

Food & farming: biotechnology is not only making agriculture more sustainable, it’s also bringing to market new and improved crops that are more nutritious, more affordable, and more delicious.

The environment: humanity’s health and well-being depend on our ability to stop and reverse climate change, and we can’t do it without biological solutions that treat carbon not as a waste product, but as the starting point for chemicals and materials that today use petroleum.

Considering all this, it doesn’t seem like an overstatement when the report authors say that U.S. competitiveness in the bioeconomy is key to maintaining the economic health and security of the country.

The very real risks to the U.S. bioeconomy

There are many things that can go wrong, causing the U.S. to lose its current edge in the global bioeconomy. Some of these are economic risks, and others present serious national security risks. All of them are related to a failure of our government to act now. Here’s a sampling of the risks to U.S. leadership at the frontiers of tech and bio:

Insufficient government R&D investment. Money for basic research and development builds the foundations of the bioeconomy. We learn, achieve new results, and create new applications. Investments that help develop enabling tools, technologies, and standards have the potential to maintain the U.S. bioeconomy competitive in a global bioeconomy.

Ineffective or inefficient regulations. Regulatory uncertainty stifles creative new approaches that may have unknown paths, long delays, or that might be prohibited by later changes.

Inadequate workforce. The U.S.’s K-12 education system may not prepare students to study STEM subjects at the university and postgraduate level, hindering the quality of workers. A skilled workforce gives U.S. companies the best talent to choose from, and it also encourages international firms to establish research and production facilities here.

Ineffective or inefficient intellectual property protections. Uncertainty over what is patentable could discourage innovators who are considering whether and how to bring their innovations to market. Patent eligibility is also important to venture capitalists and private equity investors when considering whether to invest in biotechnology companies.

Cybersecurity. As biological engineering depends more and more on massive datasets, the emerging bioeconomy now exists at the intersection of information science and biotechnological science. The bioeconomy’s growing reliance on software, networking, and computer hardware tools yields the same cyber vulnerabilities present in any other sector, including hacking, sabotage, breached privacy, or theft of intellectual property.

Biosafety and biosecurity risks. The tools of today’s bioeconomy are enabling new capabilities that can generate concerns regarding traditional biothreats. These can include the accidental or intentional creation or release of dangerous or lethal pathogens. Such biothreats can harm humans, animals, plants, agriculture, the environment, and materials.

Risks from climate change. Food and feed crops, biofuels crops, and crops used with bio-based fermentation products are susceptible to temperature and water stresses, as well as insects and pathogens that migrate with changing weather patterns.

China: the biotech elephant in the room

I’ve written previously written how the Chinese government is already making substantial investments in its bioeconomy. Here are three scary statistics, courtesy of Greg B. Scott of the ChinaBio Group:

China is out-investing the U.S. China’s private investors poured $14.4 billion into its bioeconomy in 2019. That compares to the United States’ more meager investment of $10.4 billion.

China is building a bigger bioeconomy workforce. China graduates about 8-10 million students each year. In the U.S., that number is closer to 400,000. Many Chinese students graduating from U.S. institutions stay here, but they are increasingly returning home to start highly innovative companies.

China is investing in itself. Historically, China has invested heavily in foreign companies, tech, and debt. Now we’re seeing an uptick in China-to-China investments—the country no longer needs to look abroad to find plenty of good biotech opportunities.

Chinese investments have led to centers of excellence in the regional technology hub of Shenzhen, including the Institute of Synthetic Biology at the Shenzhen Institute of Advanced Sciences (SIAT) and BGI Genomics. Shenzhen will compete for technological and economic leadership with U.S. regional biotech powerhouses such as San Francisco/Silicon Valley and Boston/Cambridge in the years to come.

Many of China’s long-standing challenges—environment, food, water, waste management, and rapid innovation to retain its global manufacturing competitiveness—are areas where synthetic biology is seen as a key technology for the future. In other words, synthetic biology is not just an academic pursuit for China. Rather, its leaders are thinking proactively about how biological engineering can be used to address the country’s strategic national interests—while U.S. leadership stands idly by.

What do we do?

So what can U.S. policymakers do to protect the U.S. bioeconomy and ensure continued technological and economic leadership in biology for the next twenty years?

Straight from the top. China has made clear its ambition to become a global tech superpower, with President Xi Jinping calling science and technology one of the main battlefronts of the economy. The U.S. administration needs to step up its game, too. President Trump recently declared January 2020 to be National Biotechnology Month, citing “boundless possibilities for economic growth, national security, healthcare, manufacturing, and agriculture.” That’s the right sentiment—now we need real action.

New legislation. Late last year, the U.S. House of Representatives passed the Engineering Biology Research and Development Act of 2019, which would direct the Office of Science and Technology Policy (OSTP) to implement a national research strategy for engineering biology. The explicit goal: maintain U.S. science, technology, and economic leadership in synthetic biology. The bill now resides in the Senate and awaits committee action. Legislative leadership is now needed to give this bill the appropriations necessary to give it real teeth, and then put it squarely on the President’s desk.

Investing for returns. The Human Genome Project is said to have returned $141 for every dollar invested by taxpayers. While “Big Science” yields tremendous benefits for everyone, it doesn’t happen without federal funding. In 2019, politically courageous Republicans and Democrats came together to produce a 2020 final spending bill that is kind to science, in essence ignoring President Trump’s proposed cuts and instead giving increases to each of the NIH, NSF, NASA, and DOE’s Office of Science. But the U.S. isn’t even in the top ten for R&D spending as a percentage of GDP, while China continues to close in on the U.S., meaning that the U.S. is no longer the uncontested global leader in science.

Leading the global bioeconomy: Have some courage

There are many things the U.S. could do to protect the American bioeconomy. But above all else, policymakers need to come together and demonstrate the kind of courage and vision needed to be a world leader. Science and technology know no partisan lines. Everybody wants healthy lives, clean water, and good jobs. Federal initiative and assistance are needed to bring these benefits to everyone living in the U.S..

Today, the American synthetic biology industry may be unprepared for the global competition it will face, lacking initiative and leadership at the highest levels of government. But this could change quickly. If a country like the U.S. makes engineering biology a national priority, anything is possible in the new bioeconomy.

#### Heg solves arms races, land grabs, rogue states, and great power war

Brands 18 [Hal, Henry Kissinger Distinguished Professor at Johns Hopkins University's School of Advanced International Studies and a senior fellow at the Center for Strategic and Budgetary Assessments." American Grand Strategy in the Age of Trump." Page 129-133]

Since World War II, the United States has had a military second to none. Since the Cold War, America has committed to having overwhelming military primacy. The idea, as George W. Bush declared in 2002, that America must possess “strengths beyond challenge” has featured in every major U.S. strategy document for a quarter century; it has also been reflected in concrete terms.6

From the early 1990s, for example, the United States consistently accounted for around 35 to 45 percent of world defense spending and maintained peerless global power-projection capabilities.7 Perhaps more important, U.S. primacy was also unrivaled in key overseas strategic regions—Europe, East Asia, the Middle East. From thrashing Saddam Hussein’s million-man Iraqi military during Operation Desert Storm, to deploying—with impunity—two carrier strike groups off Taiwan during the China-Taiwan crisis of 1995– 96, Washington has been able to project military power superior to anything a regional rival could employ even on its own geopolitical doorstep.

This military dominance has constituted the hard-power backbone of an ambitious global strategy. After the Cold War, U.S. policymakers committed to averting a return to the unstable multipolarity of earlier eras, and to perpetuating the more favorable unipolar order. They committed to building on the successes of the postwar era by further advancing liberal political values and an open international economy, and to suppressing international scourges such as rogue states, nuclear proliferation, and catastrophic terrorism. And because they recognized that military force remained the ultima ratio regum, they understood the centrality of military preponderance.

Washington would need the military power necessary to underwrite worldwide alliance commitments. It would have to preserve substantial overmatch versus any potential great-power rival. It must be able to answer the sharpest challenges to the international system, such as Saddam’s invasion of Kuwait in 1990 or jihadist extremism after 9/11. Finally, because prevailing global norms generally reflect hard-power realities, America would need the superiority to assure that its own values remained ascendant. It was impolitic to say that U.S. strategy and the international order required “strengths beyond challenge,” but it was not at all inaccurate.

American primacy, moreover, was eminently affordable. At the height of the Cold War, the United States spent over 12 percent of GDP on defense. Since the mid-1990s, the number has usually been between 3 and 4 percent.8 In a historically favorable international environment, Washington could enjoy primacy—and its geopolitical fruits—on the cheap.

Yet U.S. strategy also heeded, at least until recently, the fact that there was a limit to how cheaply that primacy could be had. The American military did shrink significantly during the 1990s, but U.S. officials understood that if Washington cut back too far, its primacy would erode to a point where it ceased to deliver its geopolitical benefits. Alliances would lose credibility; the stability of key regions would be eroded; rivals would be emboldened; international crises would go unaddressed. American primacy was thus like a reasonably priced insurance policy. It required nontrivial expenditures, but protected against far costlier outcomes.9 Washington paid its insurance premiums for two decades after the Cold War. But more recently American primacy and strategic solvency have been imperiled.

THE DARKENING HORIZON For most of the post–Cold War era, the international system was— by historical standards—remarkably benign. Dangers existed, and as the terrorist attacks of September 11, 2001, demonstrated, they could manifest with horrific effect. But for two decades after the Soviet collapse, the world was characterized by remarkably low levels of great-power competition, high levels of security in key theaters such as Europe and East Asia, and the comparative weakness of those “rogue” actors—Iran, Iraq, North Korea, al-Qaeda—who most aggressively challenged American power. During the 1990s, some observers even spoke of a “strategic pause,” the idea being that the end of the Cold War had afforded the United States a respite from normal levels of geopolitical danger and competition. Now, however, the strategic horizon is darkening, due to four factors.

First, great-power military competition is back. The world’s two leading authoritarian powers—China and Russia—are seeking regional hegemony, contesting global norms such as nonaggression and freedom of navigation, and developing the military punch to underwrite these ambitions. Notwithstanding severe economic and demographic problems, Russia has conducted a major military modernization emphasizing nuclear weapons, high-end conventional capabilities, and rapid-deployment and special operations forces— and utilized many of these capabilities in conflicts in Ukraine and Syria.10 China, meanwhile, has carried out a buildup of historic proportions, with constant-dollar defense outlays rising from US$26 billion in 1995 to US$226 billion in 2016.11 Ominously, these expenditures have funded development of power-projection and antiaccess/area denial (A2/AD) tools necessary to threaten China’s neighbors and complicate U.S. intervention on their behalf. Washington has grown accustomed to having a generational military lead; Russian and Chinese modernization efforts are now creating a far more competitive environment.

#### Independently, China uses biotech offensively—uncertainty means you should err negative

Kania and Vonrndick 19 [Elsa Kania is an Adjunct Senior Fellow with the Technology and National Security Program at the Center for a New American Security. She is also a Ph.D. candidate in Harvard University’s Department of Government. Her views are her own. Wilson VornDick consults on national security, emerging technologies, and China for Duco and Rane.) “Weaponizing Biotech: How China's Military Is Preparing for a 'New Domain of Warfare'” Defense One, Commentary, China, Biowarfare, 8/14/2019] RM

We may be on the verge of a brave new world indeed. Today’s advances in biotechnology and genetic engineering have exciting applications in medicine — yet also alarming implications, including for military affairs. China’s national strategy of military-civil fusion (军民融合) has highlighted biology as a priority, and the People’s Liberation Army could be at the forefront of expanding and exploiting this knowledge.

The PLA’s keen interest is reflected in strategic writings and research that argue that advances in biology are contributing to changing the form or character (形态) of conflict. For example:

In 2010’s War for Biological Dominance (制生权战争), Guo Jiwei (郭继卫), a professor with the Third Military Medical University, emphasizes the impact of biology on future warfare.

In 2015, then-president of the Academy of Military Medical Sciences He Fuchu (贺福初) argued that biotechnology will become the new “strategic commanding heights” of national defense, from biomaterials to "brain control" weapons. Maj. Gen. He has since become the vice president of the Academy of Military Sciences, which leads China’s military science enterprise.

Biology is among seven "new domains of warfare" discussed in a 2017 book by Zhang Shibo (张仕波), a retired general and former president of the National Defense University, who concludes: “Modern biotechnology development is gradually showing strong signs characteristic of an offensive capability,” including the possibility that “specific ethnic genetic attacks” (特定种族基因攻击) could be employed.

The 2017 edition of Science of Military Strategy (战略学), a textbook published by the PLA’s National Defense University that is considered to be relatively authoritative, debuted a section about biology as a domain of military struggle, similarly mentioning the potential for new kinds of biological warfare to include “specific ethnic genetic attacks.”

These are just a few examples of an extensive and evolving literature by Chinese military scholars and scientists who are exploring new directions in military innovation.

Following these lines of thinking, the PLA is pursuing military applications for biology and looking into promising intersections with other disciplines, including brain science, supercomputing, and artificial intelligence. Since 2016, the Central Military Commission has funded projects on military brain science, advanced biomimetic systems, biological and biomimetic materials, human performance enhancement, and “new concept” biotechnology.

Gene Editing

Meanwhile, China has been leading the world in the number of trials of the CRISPR gene-editing technology in humans. Over a dozen clinical trials are known to have been undertaken, and some of these activities have provoked global controversy. It’s not clear whether Chinese scientist He Jiankui, may have received approval or even funding from the government for editing embryos that became the world’s first genetically modified humans. The news provoked serious concerns and backlash around the world and in China, where new legislation has been introduced to increase oversight over such research. However, there are reasons to be skeptical that China will overcome its history and track record of activities that are at best ethically questionable, or at worst cruel and unusual, in healthcare and medical sciences.

But it is striking how many of China’s CRISPR trials are taking place at the PLA General Hospital, including to fight cancer. Indeed, the PLA’s medical institutions have emerged as major centers for research in gene editing and other new frontiers of military medicine and biotechnology. The PLA’s Academy of Military Medical Sciences, or AMMS, which China touts as its “cradle of training for military medical talent,” was recently placed directly under the purview of the Academy of Military Science, which itself has been transformed to concentrate on scientific and technological innovation. This change could indicate a closer integration of medical science with military research.

In 2016, an AMMS doctoral researcher published a dissertation, “Research on the Evaluation of Human Performance Enhancement Technology,” which characterized CRISPR-Cas as one of three primary technologies that might boost troops’ combat effectiveness. The supporting research looked at the effectiveness of the drug Modafinil, which has applications in cognitive enhancement; and at transcranial magnetic stimulation, a type of brain stimulation, while also contending that the “great potential” of CRISPR-Cas as a “military deterrence technology in which China should “grasp the initiative” in development.

AI + Biotech

The intersection of biotechnology and artificial intelligence promises unique synergies. The vastness of the human genome — among the biggest of big data — all but requires AI and machine learning to point the way for CRISPR-related advances in therapeutics or enhancement.

In 2016, the potential strategic value of genetic information led the Chinese government to launch the National Genebank (国家基因库), which intends to become the world’s largest repository of such data. It aims to “develop and utilize China’s valuable genetic resources, safeguard national security in bioinformatics (生物信息学), and enhance China’s capability to seize the strategic commanding heights” in the domain of biotechnology.

The effort is administered by BGI, formerly known as Beijing Genomics Inc., which is Beijing’s de facto national champion in the field. BGI has established an edge in cheap gene sequencing, concentrating on amassing massive amounts of data from a diverse array of sources. The company has a global presence, including laboratories in California and Australia.

U.S. policymakers have been concerned, if not troubled, by the company’s access to the genetic information of Americans. BGI has been pursuing a range of partnerships, including with the University of California and with the Children’s Hospital of Philadelphia on human genome sequencing. BGI’s research and partnerships in Xinjiang also raise questions about its linkage to human rights abuses, including the forced collection of genetic information from Uighurs in Xinjiang.

There also appear to be links between BGI’s research and military research activities, particularly with the PLA’s National University of Defense Technology. BGI’s bioinformatics research has used Tianhe supercomputers to process genetic information for biomedical applications, while BGI and NUDT researchers have collaborated on several publications, including the design of tools for the use of CRISPR.

Biotech’s Expansive Frontier

It will be increasingly important to keep tabs on the Chinese military’s interest in biology as an emerging domain of warfare, guided by strategists who talk about potential “genetic weapons” and the possibility of a “bloodless victory.” Although the use of CRISPR to edit genes remains novel and nascent, these tools and techniques are rapidly advancing, and what is within the realm of the possible for military applications may continue to shift as well. In the process, the lack of transparency and uncertainty of ethical considerations in China’s research initiatives raise the risks of technological surprise.

### OFF

#### Biotech R&D is set for high growth and investment now

NASDAQ 8/9 [NASDAQ is a stock market index that includes almost all stocks listed on the Nasdaq stock exchange. Along with the Dow Jones Industrial Average and S&P 500, it is one of the three most-followed stock market indices in the United States. This article was written by NASDAQ contributors and published on CNBC. The editorial staff of CNBC did not contribute to the creation of this study.) “Why the Nasdaq Biotechnology Index is poised for a run of sustainable growth” CNBC, NASDAQ, 8/9/2021, <https://www.cnbc.com/advertorial/2021/08/09/why-the-nasdaq-biotechnology-index-is-poised-for-a-run-of-sustainable-growth-.html>] RM

Between the recent bio innovation success stories in the battle against Covid-19 and the technology-driven advances ushering in new efficiencies for research and development (R&D), **the biotech industry has never been more relevant**.

As home to more than 265 companies, the pioneering Nasdaq Biotechnology Index (NBI) has long been committed to providing healthcare’s innovators with access to the capital they need to keep moving forward. Now, investors have access to the Index’s companies through a new ETF, the Invesco Nasdaq Biotechnology ETF (IBBQ).

Launched in 1993, in the wake of the original “biotech revolution” led by the discovery of recombinant DNA, NBI® remains the most representative index in the space. In fact, 98% of all U.S. listed biotech companies are listed on Nasdaq. When considering the massive growth taking place in the sector, it’s no surprise that NBI has outperformed both the S&P 500 (SPX) and Health Care Select Sector Index (IXVTR) in certain market environments.

According to Mark Marex, Index R&D Senior Specialist for Nasdaq who recently compiled an in-depth report on the NBI, global events and digital acceleration have contributed to the Index’s recent strong performance; and Nasdaq’s dedication to maintaining a true benchmark for technology-driven healthcare innovation has provided a framework for growth.

Building the ideal benchmark

Given the existence of pureplay biotech firms, hybrid biopharmaceutical companies, and less R&D-intensive pharmaceutical manufacturers, creating a single benchmark that truly captures the biotech sector and the symbiotic relationships among its players is no easy task.

One of the unique aspects of NBI, versus biotech-focused indexes created by other index providers, is its subsector classifications split between Biotechnology and Pharmaceuticals. As of June 30, 2021, ICB (FTSE Russell’s Industry Classification Benchmark) classified 222 NBI companies as Biotechnology and 47 as Pharmaceuticals. The resulting split by index weight is approximately 65% and 35%, respectively, which illustrates the major difference between the two groups: Pharmaceutical companies tend to be much larger than Biotechnology firms.

This split within a single index provides advantages for investors: While offering some exposure to more established pharmaceutical companies, it also includes R&D-heavy biotech firms that over time may transition into biotech-driven pharma companies. That’s exactly what happened this year when NBI’s largest company, Amgen (AMGN / $144Bn), was reclassified by ICB from Biotechnology to Pharmaceuticals. By retaining firms as they straddle the two classifications over the course of their lifecycle, NBI presents potential growth advantages when compared with index providers that focus rigidly on one classification versus the other.

Home to world-changing breakthroughs

Nasdaq’s vision for the Index has served it well, **both in terms of its longevity and its current role as a champion of the companies paving the way for a post-pandemic world through their technological advances and life-saving treatments**. The broad reach of NBI constituents across multiple fronts in the fight against Covid-19, for example — from diagnosis to vaccines and treatment —demonstrates the strength of its core approach.

NBI companies including Gilead and Regeneron made headlines for their successes during the pandemic with antiviral therapeutics and antibody-based therapeutics for high-risk patients. But it’s the stunning success of m-RNA vaccine technology from Moderna and BioNTech, two NBI companies, that most clearly showcase the home run potential among the biotech entrepreneurs in the space.

And while NBI is currently up 8.2% YTD on a price-return basis (as of June 30) **versus a broader market gain of 14.4% by SPX**, the S&P Biotechnology Select Industry Index (SPSIBI) is down 3.7%.

It’s worth noting that in 2020, NBI outperformed SPX with a price gain of 25.7% versus 16.3%, respectively. This shows the resilience of the NBI and the inherent strength of its current mix of companies.

The possibilities of accelerated R&D

As a whole, the life-changing work being done by NBI constituents requires enormous amounts of R&D. In 2020, R&D expenses for the entire group totaled $68.5Bn, nearly 31% of these companies’ revenue totals. Two-thirds of NBI’s firms reported R&D expenses that exceeded their revenues

For several NBI companies, however, these massive investments provided tangible benefits in the fight against Covid-19. Undoubtedly, years of back-end work and minimal profits ultimately helped deliver the very products that are now driving historic returns. Psychologically, their breakthroughs demonstrated the enormous potential of science and technology to serve humankind.

Looking ahead, **revolutions in Mapping and Engineering processes, boosted by rapid advancements in Machine Learning and Artificial Intelligence, are fostering a true fusion of Biology and Technology that could transform the traditionally costly and labor-intensive R&D function**. Some research estimates these advances could reduce the failure rate of drugs by up to 45% and shorten drug trials by up to 50%. The result could be even more breakthroughs, performed much more efficiently, greatly increasing the returns on biopharmaceutical R&D.

Even a conservative interpretation of the above numbers would significantly reduce R&D costs and boost the market capitalization of therapeutics companies from the current $2Tn up to $9Tn as soon as 2024, according to estimates from ARK Financial.

Meanwhile, increasingly cost-effective human genomics could revolutionize several other industries, from agriculture to biofuels.

By any measure, there is much to be excited about across the spectrum of biotech — especially coming out of a global pandemic. And while no person, nor index, can truly predict what the future holds, chances are strong that companies sitting within NBI will have a hand in leading the way.

“**For investors**, the Index already serves as a fascinating lens through which to view human society’s scientific and technological advancements,” says Mark Marex. “To me, it’s very exciting to ponder what the researchers, scientists, and business leaders in this space will accomplish next.”

#### IPR protections are key to sustain healthcare investments and manufacturing. Independently, it’s key to broader vaccine production.

Roberts 6/25/21 [James M. Roberts is a Research Fellow for Economic Freedom and Growth at the Heritage Foundation. Roberts' primary responsibility as one of The Heritage Foundation's lead experts in economic freedom and growth is to edit the Rule of Law and Monetary Freedom sections of [Index of Economic Freedom](https://www.heritage.org/index/). An influential annual analysis of the economic climate of countries throughout the world, the Index is co-published by Heritage and The Wall Street Journal.) “Biden’s OK of Global Theft of America’s Intellectual Property is Wrong, Dangerous.” 6/25/2021, The Heritage Foundation, Commentary—Public Health] RM

Last month, President Biden advocated removing international intellectual property rights (IPR) protections for American-made COVID-19 vaccines.

**Foreign companies may take the president’s policy as a green light to produce reverse-engineered, counterfeit substitutes**.

The best way to prevent and treat new diseases is to ensure that private American pharmaceutical companies continue their innovative research and vaccine production.

Three U.S. companies—Pfizer, Moderna, and Johnson & Johnson—created and manufactured the world’s most effective mRNA COVID vaccines in record time. An increasing majority of Americans have now been inoculated, but much of the developing world remains in desperate need of vaccines. Americans naturally want to help. The question is how.

Last month, President Biden advocated removing international intellectual property rights (IPR) protections for American-made COVID-19 vaccines. This, he said, would help make the vaccines more plentiful and available in needy countries. **It’s a short-sighted approach and doomed to fail.**

Mr. Biden wants to waive the World Trade Organization’s “Trade-Related Aspects of Intellectual Property Rights” (TRIPS) agreement for U.S. vaccines and let foreign countries issue “compulsory licenses“ allowing their domestic pharmaceutical companies to manufacture the medicines without adequately compensating the companies that invented them.

Practically speaking, countries such as India and South Africa are unlikely to manufacture the vaccines. They lack an advanced infrastructure for cold supply-chain distribution and many other crucial resources required by these products’ capital-intensive, state-of-the-art manufacturing process.

But the Biden policy is bad for many other reasons.

Developing breakthrough medications takes tremendous ingenuity and immense financial investments. **It’s an extraordinarily high-risk endeavor, and the prospect of making a profit is what convinces private companies to undertake those risks.**

Signaling that the United States will not fight to defend their intellectual property rights **actively undermines innovation and manufacturing** in American health care and medicines.

It also erodes patient protections by undermining quality control. Foreign companies may take the president’s policy as a green light to produce reverse-engineered, counterfeit substitutes. Already there are reports of ineffective and even dangerous counterfeit COVID-19 vaccines being sold around the world.

Those pushing to break U.S. pharmaceutical patents say they want to do so for altruistic reasons. Consequently, they also insist that the prices for the medications be set far below their actual value.

But history shows us that forcing private companies to provide vaccines at an “affordable price,” regardless of the cost to the companies, actually impedes the manufacture of high-quality vaccines. Moreover, it inhibits the **future development of vaccines** needed to meet as-yet-unknown diseases.

Washington first imposed vaccine price controls as part of Hillary Clinton’s 1993 healthcare-for-all crusade. As the Wall Street Journal later noted, it was a body blow to the U.S. vaccine industry. Ironically, government-decreed prices left the companies unable to produce enough vaccines to meet Mrs. Clinton’s admittedly admirable goal of universal immunization of children. Since then, U.S. firms have largely eschewed the vaccine market because they could not recoup their R&D and manufacturing costs and earn enough profit to fund future innovation.

Ultimately, **compulsory licensing legalizes the theft of intellectual property**. Recognizing this, senators from both sides of the aisle have joined with other government officials and industry leaders to call on the administration to reverse this bad decision.

The U.S. patent protection system has served the nation well since its founding.  **It is and has been a bulwark of American prosperity**, but the strength of that protection has been weakening in the past few decades. **Compulsory licensing contributes to the erosion** of that protection.

As the U.S. and the rest of the world emerge from the pandemic, it is clear that more innovative medicines and vaccines will be needed for future protection from viruses and other emerging biological threats.

**The best way to prevent and treat those new diseases is to ensure that private American pharmaceutical companies continue their innovative research and vaccine production**.

That way, U.S.-manufactured vaccines can be made available to all Americans quickly. And governments can subsidize their export and sale to other countries far more effectively and less expensively than through compulsory licensing schemes.

Meanwhile, let’s hope Mr. Biden listens to the more reasonable and less-agenda driven voices in this debate and reverses course on the TRIPS waiver.

#### COVID was a precursor to deadlier pandemics—vaccine production will determine everything.

Lander 8/4/21 [Eric Lander, President Biden’s Science Advisory and Director of the White House Office of Science and Technology Policy) “Opinion: As bad as Covid-19 has been, a future pandemic could be even worse—unless we act now” 8/4/21, The Washington Post] RM

[Coronavirus](https://www.washingtonpost.com/coronavirus/?itid=lk_inline_manual_3) vaccines can end the current pandemic if enough people choose to protect themselves and their loved ones by getting vaccinated. But in the years to come, we will still need to defend against a pandemic side effect: collective amnesia.

As public health emergencies recede, societies often quickly forget their experiences — and **fail to prepare for future challenges**. For pandemics, such a course would be disastrous.

**New infectious diseases have been emerging at an accelerating pace,** and they are spreading faster.

Our federal government is responsible for defending the United States against future threats. That’s why President Biden has asked Congress to fund his plan to build on current scientific progress to keep new infectious-disease threats from turning into pandemics like covid-19.

As the president’s science adviser, I know what’s becoming possible. For the first time in our history, we have an opportunity not just to refill our stockpiles but also to transform our capabilities. However, **if we don’t start preparing now for future pandemics, the window for action will close.**

Covid-19 has been a catastrophe: The toll in the United States alone is [more than 614,000 lives](https://www.washingtonpost.com/graphics/2020/national/coronavirus-us-cases-deaths/?itid=lk_inline_manual_11) and has been estimated to exceed [$16 trillion](https://jamanetwork.com/journals/jama/fullarticle/2771764), with disproportionate impact on vulnerable and marginalized communities.

But a future pandemic could be even worse — unless we take steps now.

It’s important to remember that the virus behind covid-19 is far less deadly than the 1918 influenza. The virus also belongs to a well-understood family, coronaviruses. It was possible to design vaccines within days of knowing the virus’s genetic code because 20 years of [basic scientific research](https://science.sciencemag.org/content/372/6538/109.full) had revealed which protein to target and how to stabilize it. And while the current virus spins off variants, its mutation rate is slower than that of most viruses.

**Unfortunately, most of the 26 families of viruses that infect humans are less well understood or harder to control**. We have a great deal of work still ahead.

The development of [mRNA vaccine technology](https://www.washingtonpost.com/health/2020/12/06/covid-vaccine-messenger-rna/?itid=lk_inline_manual_17) — thanks to more than a decade of foresighted basic research — was a game-changer. It shortened the time needed to design and test vaccines to less than a year — far faster than for any previous vaccine. And it’s been surprisingly effective against covid-19.

Still, there’s much more to do. We don’t yet know how mRNA vaccines will perform against other viruses down the road. And **when the next pandemic breaks out, we’ll want to be able to respond even faster.**

Fortunately, the scientific community has been developing a bold plan to keep future viruses from becoming pandemics.

Here are a few of the goals we should shoot for:

The capability to design, test and approve safe and effective vaccines within 100 days of detecting a pandemic threat (for covid-19, that would have meant May 2020); manufacture enough doses to supply the world within 200 days; and speed vaccination campaigns by replacing sterile injections with skin patches.

Diagnostics simple and cheap enough for daily home testing to limit spread and target medical care.

Early-warning systems to spot new biological threats anywhere in the world soon after they emerge and monitor them thereafter.

We desperately need to strengthen our public health system — from expanding the workforce to modernizing labs and data systems — including to ensure that vulnerable populations are protected.

And we need to coordinate actions with our international partners, because pandemics know no borders.

These goals are ambitious, but they’re feasible — provided the work is managed with the seriousness, focus and accountability of NASA’s Apollo Program, which sent humans to the moon.

Importantly, these capabilities won’t just prepare us for future pandemics; they’ll also improve public health and medical care for infectious diseases today.

Preparing for threats is a core national responsibility. That’s why our government invests heavily in missile defense and counterterrorism. We need to similarly protect the nation against biological threats, which range from the ongoing risk of pandemics to the possibility of deliberate use of bioweapons.

Pandemics cause massive death and disruption. From a financial standpoint, they’re also astronomically expensive. If, as might be expected from [history](https://www.cfr.org/timeline/major-epidemics-modern-era) and current trends, we suffered a pandemic of the current scale every two decades, the annualized cost would exceed $500 billion per year. Investing a much smaller amount to avert this toll is an economic and moral imperative.

The White House will put forward a detailed plan this month to ensure that the United States can fully prepare before the next outbreak. It’s hard to imagine a higher economic or human return on national investment.

#### Ecosystem sensitivity from climate change means future pandemics will cause extinction—assumes COVID

Supriya 4/19 [Lakshmi Supriya got her BSc in Industrial Chemistry from IIT Kharagpur (India) and a Ph.D. in Polymer Science and Engineering from Virginia Tech (USA). She has more than a decade of global industry experience working in the USA, Europe, and India. After her Ph.D., she worked as part of the R&D group in diverse industries starting with semiconductor packaging at Intel, Arizona, where she developed a new elastomeric thermal solution, which has now been commercialized and is used in the core i3 and i5 processors. From there she went on to work at two startups, one managing the microfluidics chip manufacturing lab at a biotechnology company and the other developing polymer formulations for oil extraction from oil sands. She also worked at Saint Gobain North America, developing various material solutions for photovoltaics and processing techniques and new applications for fluoropolymers. Most recently, she managed the Indian R&D team of Enthone (now part of MacDermid) developing electroplating technologies for precious metals.) “Humans versus viruses - Can we avoid extinction in near future?” News Medical Life Sciences, 4/19/21, https://www.news-medical.net/news/20210419/Humans-versus-viruses-Can-we-avoid-extinction-in-near-future.aspx] RM

Expert argues that human-caused changes to the environment can lead to the emergence of pathogens, not only from outside but also from our own microbiome, which can pave the way for large-scale destruction of humans and **even our extinction**.

Whenever there is a change in any system, it will cause other changes to reach a balance or equilibrium, generally at a point different from the original balance. Although this principle was originally posited by the French chemist Henry Le Chatelier for chemical reactions, this theory can be applied to almost anything else.

In an essay published on the online server Preprints\*, Eleftherios P. Diamandis of the University of Toronto and the Mount Sinai Hospital, Toronto, argues that changes caused by humans, to the climate, and everything around us will lead to changes that may have a dramatic impact on human life. Because our ecosystems are so complex, we don’t know how our actions will affect us in the long run, so humans generally disregard them.

Changing our environment

Everything around us is changing, from living organisms to the climate, water, and soil. Some estimates say about half the organisms that existed 50 years ago have already become extinct, and about 80% of the species may become extinct in the future.

As the debate on global warming continues, according to data, the last six years have been the warmest on record. Global warming is melting ice, and sea levels have been increasing. The changing climate is causing more and more wildfires, which are leading to other related damage. At the same time, increased flooding is causing large-scale devastation.

One question that arises is how much environmental damage have humans already done? A recent study compared the natural biomass on Earth to the mass produced by humans and found humans produce a mass equal to their weight every week. This human-made mass is mainly for buildings, roads, and plastic products.

In the early 1900s, human-made mass was about 3% of the global biomass. Today both are about equal. Projections say by 2040, the human-made mass will be triple that of Earth’s biomass. But, slowing down human activity that causes such production may be difficult, given it is considered part of our growth as a civilization.

Emerging pathogens

Although we are made up of human cells, we have almost ten times that of bacteria just in our guts and more on our skin. These microbes not only affect locally but also affect the entire body. There is a balance between the good and bad bacteria, and any change in the environment may cause this balance to shift, especially on the skin, the consequences of which are unknown.

Although most bacteria on and inside of us are harmless, gut bacteria can also have viruses. If viruses don’t kill the bacteria immediately, they can incorporate into the bacterial genome and stay latent for a long time until reactivation by environmental factors, when they can become pathogenic. They can also escape from the gut and enter other organs or the bloodstream. Bacteria can then use these viruses to kill other bacteria or help them evolve to more virulent strains.

An example of the evolution of pathogens is the cause of the current pandemic, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Several mutations are now known that make the virus more infectious and resistant to immune responses, and strengthening its to enter cells via surface receptors.

The brain

There is evidence that the SARS-CoV-2 can also affect the brain. The virus may enter the brain via the olfactory tract or through the angiotensin-converting enzyme 2 (ACE2) pathway. Viruses can also affect our senses, such as a loss of smell and taste, and there could be other so far unkown neurological effects. The loss of smell seen in COVID-19 could be a new viral syndrome specific to this disease.

Many books and movies have described pandemics caused by pathogens that wipe out large populations and cause severe diseases. In the essay, the author provides a hypothetical scenario where a gut bacteria suddenly starts producing viral proteins. Some virions spread through the body and get transmitted through the human population. After a few months, the virus started causing blindness, and within a year, large populations lost their vision.

Pandemics can cause other diseases that can threaten humanity’s entire existence. **The COVID-19 pandemic brought this possibility to the forefront**. If we continue disturbing the equilibrium between us and the environment, we don’t know what the consequences may be and **the next pandemic could lead us to extinction.**

### Case

#### The aff reverses innovative potential

Cory 17 [Nigel Cory is a trade policy analyst at the Information Technology and Innovation Foundation.April 30, 2017, “How Intellectual Property Protection Incentivizes Innovation” <https://www.globaltrademag.com/intellectual-property-protection-incentivizes-innovation/> //gord0]

World Intellectual Property Day was marked last week, an important moment to consider the critical relationship between [intellectual property (IP) protection](https://www.globaltrademag.com/global-trade-daily/commentary/free-trade-and-the-threat-to-intellectual-property-protection-in-china) and innovation. Just as we have in years past, the [Information Technology and Innovation Foundation (ITIF)](https://www.globaltrademag.com/global-trade-daily/trump-right-china-poses-economic-threat) took a deeper look at the latest data on the strength of IP laws and the amount of innovative, creative output around the word, and found that overall, countries with stronger IP protection also have more creative output, even at varying levels of development. The results show why countries need to support efforts to ensure international rules address new and emerging IP issues in order to ensure that firms and countries are maximizing their innovative and creative potential. ITIF compared the strength of IP laws and the effectiveness of anti-counterfeiting laws based on data from the World Economic Forum’s Global Competitiveness Report 2016-17 with creative output scores from the Global Innovation Index 2016, a report from Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO). The Global Innovation Index combines three measures of creativity. First, “intangible assets” combines measures of domestic and international trademark applications and rates of information and communication technology adoption. Second, “creative goods and services” measures trade in creative services and output by a nation’s media, printing and publishing, and entertainment industries. Finally, “online creativity” measures a nation’s top-level internet domains, as well as the number of YouTube videos uploaded and Wikipedia pages edited. The key finding is that there is a strong positive correlation (0.74) between the strength of IP protections and countries’ score on creative outputs, based on a sample of 119 countries (only those countries which had all the necessary data). ITIF assessments in 2016 and 2014 produced similar results of 0.70 (from a sample of 127 countries) and 0.72 (from a sample of 136). Some advocates that are opposed to IP protections claim IP only benefits high-income countries. To test whether the correlation was solely based on income, the data were divided between high-income (>$20,000 GDP per capita), middle-income ($5,000-$19,999 GDP per capita), and low-income nations (<$5,000 GDP per capita). The sample has 33 high-income countries, 37 middle-income countries, and 49 low-income countries. Similar to past years, the relationship between IP protection and creative output was strongest in high-income countries, with a correlation of 0.51, but it was still positive for both middle-income (0.19) and low-income countries (0.22). In other words, even for the poorest nations, stronger IP protection was associated with stronger creative outputs, which in turn lead to job creation and GDP growth. As in past reports, the Global Competitiveness Report 2016-17 shows that it’s difficult for countries to score well in creative outputs without ranking highly in intellectual property protections. The average level of IP protection for the top 20 most-creative countries (5.85 out of 7) is well above the average (4.37). Delving deeper, the analysis shows that the 50 countries with above average total creative outputs also have above average intellectual property protections (5.01). ***Setting New International Norms: Analyzing IP, Creative Output, and Trade Agreements*** At the multilateral level, the World Intellectual Property Organization’s Copyright Treaty sets a basic framework for its 95 member-countries to enact to prevent unauthorized access to and use of creative works on the Internet, such as for computer programs and databases. Along with the Performances and Phonogram Treaty, it comprises WIPO’s “Internet Treaties,” which aim to update and supplement core international IP agreements—the Berne Convention and Rome Convention—which were adopted or last revised over 50 years ago. This year’s analysis shows the value of the Copyright Treaty’s basic levels of digital IP protections. Our analysis included 88 of the 95 WIPO Copyright Treaty members. These nations had a level of IP protection and creative output above the average for the entire sample: 4.5 vs. 4.37, and 93.5 vs. 87.7, respectively. Meanwhile, non-members (the sample included 31) had an average level of protection and creative output well below the average: 4 vs. 4.37, and 71 vs. 87, respectively. These results show why bilateral, regional, and multilateral efforts to update the issues addressed by the Copyright Treaty and other digital IP issues should be supported. Given that this treaty was negotiated in the 1990s and came into force in 2002, there are obvious needs for further updates given changes in technology and the digital economy. Efforts to set higher common levels of IP protection and enforcement have mainly occurred at the regional level, especially in the Asia-Pacific, with the [Trans-Pacific Partnership (TPP)](https://www.globaltrademag.com/global-trade-daily/commentary/trans-pacific-partnership-questions-answers) leading the way and the Regional Comprehensive Economic Partnership (RCEP) addressing this as well. Unfortunately, the future of the TPP is in serious doubt given America’s withdrawal, but if the other 11 members were to decide to implement the agreement, it would hopefully include the TPP’s high-standard IP chapter. Still, the TPP’s developing-country members (Malaysia, Vietnam, and Peru) need to make significant progress to close the gap to developed-country-member levels of protection and creative output. In 2016, out 119 countries, Malaysia ranked 27th in IP protection and 42nd in output (both improvements from 109th and 34th in 2015, which had 127 countries), Vietnam ranked 92nd and 51st (up from 82nd and down from 54th), and Peru ranked 100th and 67th (slightly up from 96th and 61st). RCEP shows an even bigger gulf between leaders and laggards. The 16 members of RCEP include developed countries with high-standard free trade agreements and IP systems (such as Australia, Singapore, and Korea), but also a broader range of developing countries that do poorly with IP protection and creative output (such as Cambodia, China, India, the Philippines, and Thailand). Developing-country members of RCEP have a below-average level of IP protection (4.05) and total creative output (72.8). In reality, this underperformance is likely much worse given Laos and Myanmar are not included in the sample due to a lack of data. The membership complicates the potential for a high-standard IP chapter. While China has made efforts to improve its domestic IP and innovation systems, it has likewise sought to steal or coerce IP from foreign firms and has failed to push for strong IP as part of past trade agreements. Other RCEP members have also not prioritized IP in their past trade agreements, so the level of ambition in RCEP is going to be much lower than TPP if these members prevail over the countries with well-developed IP systems, such as Australia, Japan, Korea, and Singapore, especially if the RCEP succumbs to the same misguided scare campaign as the TPP’s IP chapter. However, IP is just one of many divisions that could prolong, or ultimately doom, RCEP’s future. ***Correlation Does Not Equal Causation, But IP is Key to Incentivizing Creativity and Innovation*** Of course, correlation does not equal causation, and enacting higher levels of intellectual property protections will not always automatically lead to greater creative output. IP does not function in a void without other policy support. An OECD literature review and empirical study found that efforts to strengthen IP protections over the last two decades had a positive economic impact but that variations were due to certain complementary factors, such as human capital, legal and institutional conditions, and fiscal incentives. This all leads back to a central point worth remembering this World Intellectual Property Day: Whether a country is trying to catch up to the technology frontier, or push it ahead, stronger intellectual property protections are crucial to incentivizing the creativity and innovation that helps make this happen. Given this, countries—at all levels of development—that want to spur innovation need to support efforts to ensure international norms reflect the modern challenges facing IP protection and enforcement and help set better, shared IP rules in order to ensure that firms and countries are maximizing their innovative and creative potential.

#### IPR good for innovation

Shultz and Stevens 1/14 Mark Schultz is the Goodyear Endowed Chair in Intellectual Property Law at the University of Akron School of Law, United States. Philip Stevens is Executive Director of Geneva Network., Geneva Network, "Why intellectual property rights matter for COVID-19 - Geneva Network - Intellectual Property Rights and Covid-19", January 14th, 2021, https://geneva-network.com/research/why-intellectual-property-rights-matter-for-covid-19/ - BD

Fears of COVID-19 and IP

As soon as the world began to realize the scale of the potential threat from COVID-19, certain academics and activists rolled out shopworn criticisms of intellectual property. While researchers and drug companies began work to develop the vaccines and therapeutics necessary to end the pandemic, scholars and health activists warned that intellectual property rights would thwart the effort.

Some asserted that intellectual property would inevitably hold up urgent research. They theorised that the “winner-takes-all” nature of intellectual property rights, especially patents, would prevent scientists from rapidly disclosing research results, and discourage the sharing of unpatentable insights that may potentially lead to patentable treatments with further work.

Members of Congress warned that IP would “put public health at risk”, while NGO Médecins Sans Frontières (MSF) called for “no patents or profiteering” on yet to be developed health technologies. A coalition of over 500 NGOs claimed that IP rights were a “hindrance” to efforts to tackle the pandemic, calling for all COVID-19-related IP to be rescinded.

As events demonstrated, critics of IP were wrong by a wide margin. In January 2020 very little was known about COVID-19. By January 2021, three safe and highly efficacious vaccines had been authorised for use by stringent regulatory authorities, with several others poised to follow.

As of 21st December 2o20, there were 1052 COVID-19-19 vaccines, therapeutics and diagnostic tools under development or approved globally, of which 219 are vaccines. This major achievement is a testament to how well the IP system has worked during the pandemic.

Calls to override intellectual property rights in the early stages of the pandemic were seductive and were backed by respected global humanitarian NGOs and prominent political figures. But it is to the credit of the majority of governments that they held their nerve and ignored such calls, despite the growing urgency of the situation over 2020.

#### IP key to innovation

Shultz and Stevens 1/14 Mark Schultz is the Goodyear Endowed Chair in Intellectual Property Law at the University of Akron School of Law, United States. Philip Stevens is Executive Director of Geneva Network., Geneva Network, "Why intellectual property rights matter for COVID-19 - Geneva Network - Intellectual Property Rights and Covid-19", January 14th, 2021, https://geneva-network.com/research/why-intellectual-property-rights-matter-for-covid-19/ - BD

Building on existing IP

IP is the bedrock upon which today’s COVID-19 vaccines have been built. The technologies they are based on did not come out of thin air at the beginning of the pandemic, but had been under development for decades, with substantial research in academic labs followed by years of risky investment by commercial start-ups.

Consider the messenger RNA (mRNA) technology that is the basis for two of the first vaccines approved in Western countries. Scientists discovered in 1961 that mRNA could be used to “reprogram” cells to battle disease. It took decades of lab research and private sector-funded development by startups BioNTech and Moderna to overcome major difficulties and turn the technology into an effective vaccine that can be safely given to patients.

Both companies and their investors have spent billions of dollars on mRNA research prior to the pandemic.

While academic research is fundamental, the end result would not have been possible without the private sector, which depends on intellectual property rights.

Shortly before the pandemic started, we spoke to Dr. Derrick Rossi, the academic founder of Moderna. When asked whether the treatments could be brought from the academic lab to patients without the help of the private sector, Dr. Rossi’s reply was categorical: “Not a chance. Academics are good at academia and fundamental science. They are not good at developing drugs for patients.”

Dr. Rossi explains that bringing a drug to market takes many professionals, sharing their labour and diverse expertise. “This industry of professionals is out there… The more people that are involved in the chain, post-academic discovery, the more you have pros involved — all the way from IP filings to VCs to due diligence to assembling a team,” the more likely you are to develop a viable treatment.

Developing a practical application for a great academic insight takes vast sums, and investors need some prospect of a return on that investment. As Dr. Rossi explains, “you can be working on the coolest thing, but investors need to know that there is some protection for their investment, plain and simple.”