# 1

#### Pharmaceutical innovation is accelerating now – new medicines are substantially better than existing treatments.

Wills, MBA, and Lipkus, PhD, 20 – Todd J. Wills [Managing Director @ Chemical Abstracts Service, MBA from THE Ohio State University] and Alan H. Lipkus [Senior Data Analyst @ Chemical Abstracts Service, PhD Physical Chemistry from the University of Rochester], “Structural Approach to Assessing the Innovativeness of New Drugs Finds Accelerating Rate of Innovation,” ACS Medicinal Chemistry Letters, Vol. 11, 2020, <https://pubs.acs.org/doi/pdf/10.1021/acsmedchemlett.0c00319> C.VC

Despite recent concerns over an innovation crisis, this analysis shows pharmaceutical innovation has actually increased over the last several decades based on the structural novelty of approved NMEs. The higher proportion of Pioneers over the most recent decade is a sign that innovation within the industry is accelerating rather than slowing. It is also an encouraging sign for the state of innovation in drug discovery that these Pioneers are significantly more likely to be the source of promising new therapies that are expected to provide substantial clinical advantages over existing treatments. Drug hunters are discovering Pioneers in newer and less explored regions of chemical space as they are increasingly found on scaffolds first reported in the CAS REGISTRY five or less years prior to their IND year or on scaffolds populated with 50 or less other compounds at the time of IND.

As scale becomes less of a strategic advantage, Big Pharma’s share of Pioneers has decreased even though the number of Big Pharma originated Pioneers has increased. This has created a structural innovation gap between Big Pharma and the Rest of Ecosystem which has widened over the last two decades as the Rest of Ecosystem is now responsible for originating almost 3 out of every 4 Pioneers. Pioneers originated by the Rest of Ecosystem are increasingly on new scaffolds, while a majority of Big Pharma originated Pioneers have historically been on new scaffolds.

The work presented here was intended as a study of drug innovation at a macro level. As a result, it included substances of various sizes with different degrees of complexity belonging to a range of functional and drug classes. Even though it was outside the scope of the present work to study specific subsets, such focused studies could yield additional insights into how innovation at a more micro level has changed over time. Other interesting subsets of our data set are the shapes and scaffolds of the Settlers and Colonists. Many of these shapes and scaffolds are privileged in the sense that they are seemingly capable of serving as ligands for a diverse array of target proteins. A separate study of the Settlers and Colonists as well as their side chains could provide insights into possible target-specific innovation trends.

As it often takes more than 10 years after initial discovery for an experimental drug to gain FDA approval, any measure of drug innovation that relies on the time of approval incorporates a significant time lag between initial discovery and ultimate approval. However, characterizing drug innovation based on structural novelty provides a means to assess the forward-looking innovation potential of an experimental drug at the time of initial discovery by comparing its framework information (at the scaffold and shape level) with prior FDA-approved drugs. Therefore, a separate study of drug candidates with publically disclosed structures currently in clinical development could provide additional insights into innovation trends at an FDA regulatory review level and serve as a leading indicator of innovation trends at an FDA approval level.

Given the tremendous opportunity represented by the vast amount of chemical space yet to be explored, drug-hunters of all types will continue pushing the boundaries to find promising new therapies in previously unexplored areas of chemical space. The race to discover these new drugs will be fueled by further advancements in screening approaches and in-silico methods (including innovations related to machine learning algorithms and molecular representations). However, comprehensive data on known shapes and scaffolds can fast track the identification of meaningful open areas of chemical space (shapes or scaffolds that are potentially important but have never been used as the basis for a molecule) to further explore.

#### The plan sets a precedent that IP means nothing – that dooms long term biopharma innovation.

Peter J. **Pitts 21,** former associate commissioner of the FDA, is president of the Center for Medicine in the Public Interest, “Waiving Covid-19 Vaccine Patents Is a Bad Idea and Sets a Dangerous Precedent,” 6-21-2021, https://medecon.org/waiving-covid-19-vaccine-patents-is-a-bad-idea-and-sets-a-dangerous-precedent/

It all sounds so simple: to hasten the end of the pandemic globally, suspend intellectual property protections on Covid-19 vaccines to allow swift production of low-cost copies the world over. The Biden administration has bought into exactly that strategy at the World Trade Organization.

But some simple ideas are also simplistic, and this one is dangerously so. Waiving patent rights for Covid-19 vaccines will actually slow their availability in the developing world, thereby prolonging the pandemic. The production of these breakthrough Covid-19 vaccines requires sophisticated processes, procedures, staff training, material, and manufacturing. Under typical patent-protected arrangements for new global production facilities, patent-holders voluntarily license their product information to qualified third party-manufacturers. The patent-owners work closely with the licensees to stand up facilities that meet rigorous technological specifications and standards for safety. Even under ideal conditions, it can take a year or longer to build out this infrastructure the right way. The WTO waiver blows up this careful process by allowing pretty much anyone to go into the business of producing Covid-19 vaccines. Suddenly, it’s the wild west out there, with legitimate producers trying to compete with aggressive cost and corner-cutters, to **say nothing of the outright fraud that has long driven the lucrative counterfeit drug trade**. All the research demonstrating the safety and efficacy of the Covid-19 vaccines goes out the window under such conditions. Nor is such a process going to produce faster results. Historically, under compulsory rather than voluntary licensing arrangements, **it has taken even legitimate generic manufacturers years to receive the formulas**, work out logistical challenges, and scale up production. In one case of compulsory licensing, it took over four years to bring a generic AIDS drug to Rwanda. The World Health Organization regularly publishes a list of “essential” medications, the vast majority of which patent protections have long expired. Any generic manufacturer can therefore set itself up producing them. Yet the WHO reports that availability of these medicines in many parts of the developing world remains spotty, at best. The quality of many of these essential medicines is also questionable. Yet none of the drugs on the WHO list are in the same universe of complexity as the Covid-19 vaccines. The patent system is not the problem here. But, some ask, why should private companies enjoy the property rights to innovation driven by government funding? This question likewise misses the mark. In a study of 478 drugs less than 10 percent had a public-sector patent associated with it. While providing no gain, compulsory licensing promises lots of pain. **Shunting aside patent and intellectual property rights sends a dangerous signal to innovative biopharmaceutical companies and their investors.** Biopharmaceutical research is risky. It costs almost $3 billion, on average, to bring a single medicine to pharmacy shelves. Biotech investors take these risks because of strong patent protection like those in the United States. Scientists in America now develop over half of all new drugs worldwide. It’s important to understand the current advocacy for a “temporary” IP waiver. A small but vocal and influential public health policy cohort believes that IP protections are the most significant cause of global healthcare disparities. Their philosophies repeat and reinforce many misconceptions about the problem of improving global access to medicines. The reality is that, in order to save the world, we must all work together as partners. A free-market healthcare paradigm for drug development, although far from perfect, works. A well-appointed armamentarium of Covid-19 diagnostic tools, therapeutics, and vaccines – all invented in under one year, speaks to the power of today’s innovation ecosystem. That ecosystem is built on IP protections. Right now, under voluntary licensing, global production capacity for Covid vaccines and treatments is **expanding and accelerating**. A move to nullify IP will not result in a single resident of the developing world getting vaccinated one minute sooner.

**Pharmaceutical innovation is key to protecting against future pandemics, bioterrorism, and antibiotic resistance.**

**Marjanovic and Fejiao ‘20** Marjanovic, Sonja, and Carolina Feijao. Sonja Marjanovic, Ph.D., Judge Business School, University of Cambridge. Carolina Feijao, Ph.D. in biochemistry, University of Cambridge; M.Sc. in quantitive biology, Imperial College London; B.Sc. in biology, University of Lisbon. "Pharmaceutical Innovation for Infectious Disease Management: From Troubleshooting to Sustainable Models of Engagement." (2020). [Quality Control]

As key actors in the healthcare innovation landscape, pharmaceutical and life sci-ences companies have been called on to develop medicines, vaccines and diagnostics for pressing public health challenges. The COVID-19 crisis is one such challenge, but there are many others. For example, MERS, SARS, Ebola, Zika and avian and swine flu are also infectious diseases that represent public health threats. Infectious agents such as anthrax, smallpox and tularemia could present threats in a **bioterrorism con-text**.1 The general threat to public health that is posed by **antimicrobial resistance** is also **well-recognised** as an area **in need of pharmaceutical innovation**. Innovating in response to these challenges does not always align well with pharmaceutical industry commercial models, shareholder expectations and compe-tition within the industry. However, the expertise, networks and infrastructure that industry has within its reach, as well as public expectations and the moral imperative, make pharmaceutical companies and the wider life sciences sector an **indispensable** partner in the search for solutions that save lives. This perspective argues for the need to establish more sustainable and scalable ways of incentivising pharmaceu-tical innovation in response to infectious disease threats to public health. It considers both past and current examples of efforts to mobilise pharmaceutical innovation in high commercial risk areas, including in the context of current efforts to respond to the COVID-19 pandemic. In global pandemic crises like COVID-19, the urgency and scale of the crisis – as well as the spotlight placed on pharmaceutical companies – mean that contributing to the search for effective medicines, vaccines or diagnostics is **essential** for socially responsible companies in the sec-tor.2 It is therefore unsurprising that we are seeing indus-try-wide efforts unfold at unprecedented scale and pace. Whereas there is always scope for more activity, industry is currently contributing in a variety of ways. Examples include pharmaceutical companies donating existing com-pounds to assess their utility in the fight against COVID-19; screening existing compound libraries in-house or with partners to see if they can be repurposed; accelerating tri-als for potentially effective medicine or vaccine candidates; and in some cases rapidly accelerating in-house research and development to discover new treatments or vaccine agents and develop diagnostics tests.3,4 Pharmaceutical companies are collaborating with each other in some of these efforts and participating in global R&D partnerships (such as the Innovative Medicines Initiative effort to accel-erate the development of potential therapies for COVID-19) and supporting national efforts to expand diagnosis and testing capacity and ensure affordable and ready access to potential solutions.3,5,6 The primary purpose of such innovation is to **benefit patients** and wider **population health**. Although there are also reputational benefits from involvement that can be realised across the industry, there are likely to be rela-tively few companies that are ‘commercial’ winners. Those who might gain substantial revenues will be under pres-sure not to be seen as profiting from the pandemic. In the United Kingdom for example, GSK has stated that it does not expect to profit from its COVID-19 related activities and that any gains will be invested in supporting research and long-term pandemic preparedness, as well as in developing products that would be affordable in the world’s poorest countries.7 Similarly, in the United States AbbVie has waived intellectual property rights for an existing com-bination product that is being tested for therapeutic poten-tial against COVID-19, which would support affordability and allow for a supply of generics.8,9 Johnson & Johnson has stated that its potential vaccine – which is expected to begin trials – will be available on a not-for-profit basis during the pandemic.10 Pharma is mobilising substantial efforts to rise to the COVID-19 challenge at hand. However, we need to consider how pharmaceutical innovation for responding to emerging infectious diseases can best be enabled beyond the current crisis. Many public health threats (including those associated with other **infectious diseases**, **bioterror-ism** agents **and antimicrobial resistance**) are **urgently in need of pharmaceutical innovation**, **even if their impacts are not as visible** to society **as COVID**-19 is in the imme-diate term. The pharmaceutical industry has responded to previous public health emergencies associated with infec-tious disease in recent times – for example those associated with Ebola and Zika outbreaks.11 However, it has done so to a lesser scale than for COVID-19 and with contribu-tions from fewer companies. Similarly, levels of activity in response to the threat of antimicrobial resistance are still **low**.12 There are important policy questions as to whether – and how – industry could engage with such public health threats to an even greater extent under improved innova-tion conditions.

#### Bioterrorism and future pandemics cause extinction.

Hamish De Bretton-Gordon, CBRN Expert @ British Army, 20 [Director @ DBG Defense, Consultant on CBRN and Biosecurity], “Biosecurity in the Wake of COVID-19: The Urgent Action Needed,” Combatting Terrorism Center Sentinel, November/December 2020, Volume 13, Issue 11, <https://ctc.usma.edu/biosecurity-in-the-wake-of-covid-19-the-urgent-action-needed/> C.VC

Policymakers around the world did not grasp just how large the impact of a bio threat could be. Beyond the enormous human and economic impact, the current pandemic has exposed the weakness, lack of preparedness, and poor responsiveness of healthcare systems of even highly developed countries like the United States and the United Kingdom. And the virus has inflicted carnage, even though SARS-CoV-2 (the virus that causes COVID-19) is not especially virulent. The world may be confronted with other viruses in the future whose combination of virulence (the harm a pathogen does to its host), transmissibility, and other characteristics pose much greater danger.

While overwhelming evidence points to SARS-CoV-2 spontaneously spreading to humans, the advances in synthetic biology and the growth in the number of Level 3 and 4 biocontainment facilities around the world storing deadly viruses1 mean there is also the very real possibility that in the future, bad actors will try to engineer or steal/obtain a highly transmissible and highly virulent virus and unleash it onto the world. Another risk is accidental releases from such biocontainment facilities.

COVID-19, a highly transmissible but not very virulent pathogen, has had a devastating global impact, a fact that will not have gone unnoticed by rogue states and terror organizations. Advances in synthetic biology have created tools that could be put to malevolent use. In the last two decades, scientists synthesized the poliovirus from its genetic sequence,2 recreated the 1918 Spanish flu virus,3 and succeeded in modifying the H5N1 avian flu virus so that it resulted (in a research laboratory) in airborne transmission among mammals.4 In the future, we should think of weaponized biology as no less of an existential threat to the planet than weaponized atomic science. It should also be noted that the fear and panic that even a medium-scale bioterror attack could create could have dangerous implications that may rival or even surpass the immediate loss of life.

The Need to Rethink Likelihood

Given the fact that in late 2019 when, as far as is known, COVID-19 cases first started emerging in China, it had been more than a century since the previous catastrophic outbreak (the 1918-1919 “Spanish flu” pandemic),d it was unsurprising that many thought of such pandemics as a one-in-a-100-year event. Such assumptions should no longer hold. The encroachment of human settlements into areas that had previously been sanctuaries for wildlife5 and the popularity in some parts of the world of markets where people and wild animals are brought into proximity have made it more likely viruses will make the species leap to human beings.e And when they do, as the COVID-19 pandemic illustrated, the interconnectedness of a world in which millions of people fly each day6 means they can spread very rapidly.

There is also growing concern about engineered viruses. Not only have advances in synthetic biology (SynBio) created growing capacity for extremely dangerous viruses to be engineered in a laboratory, but the number of people with access to potentially dangerous ‘dual use’ technology has greatly expanded and continues to expand, making malevolent use of such technology ever more likely.

In the August 2020 issue of this publication, scientists at the U.S. Military Academy at West Point warned that:

The wide availability of the protocols, procedures, and techniques necessary to produce and modify living organisms combined with an exponential increase in the availability of genetic data is leading to a revolution in science affecting the threat landscape that can be rivaled only by the development of the atomic bomb. As the technology improves, the level of education and skills necessary to engineer biological agents decreases. Whereas only state actors historically had the resources to develop and employ biological weapons, SynBio is changing the threat paradigm.

The cost threshold of engineering viruses is also lowering, with the West Point scientists warning that synthetic biology has “placed the ability to recreate some of the deadliest infectious diseases known well within the grasp of the state-sponsored terrorist and the talented non-state actor.”7

As already noted, another source of vulnerability is that deadly viruses could be stolen from or escape from a research laboratory. There are now around 50 Biosafety Level 4f facilities around the world, where the deadliest pathogens are stored and worked on, and this figure is set to increase in the next few years.g This is a large increase over the last 30 years, creating bigger risk of a breach. Of equal, if not greater concern are the thousands of Biosafety Level 3 labs globally,8 which handle deadly pathogens like COVID-19.9

Given what has been outlined above, the risk of a future destructive biological attack or another devastating global pandemic should no longer be seen as low. From this point forward, there should no higher priority for the international community than biosecurity.

# 2

#### The United States federal government should commit to purchasing sufficient doses of COVID-19 vaccines to meet global demand and establish public-private partnerships to expand global vaccine manufacturing capacity.

#### Buying and exporting vaccines solves while avoiding the innovation DA.

Gianna **Gancia 21**, (IT, ID) is a member of Parliament’s Development Committee, “Why waiving patents on vaccines is not a good idea,” Parliament Magazine, 5-14-2021, https://www.theparliamentmagazine.eu/news/article/why-waiving-patents-on-vaccines-is-not-a-good-idea

In fact, there would be no incentive for pharmaceutical companies to conduct research, not only into COVID-19 (let's not forget that much still needs to be done to achieve an effective and minimally invasive therapeutic treatment in case of infection and severe symptoms) **but also for future pandemic crises that, in a globalised world, are unfortunately entirely predictable.** But the negative effects would not stop with pandemic crises. What would happen if one day, hopefully very near, an extremely effective anti-cancer drug was discovered by a pharmaceutical company? Would patents be suspended yet again? **It is obvious that investment in cancer drug research would be drastically reduced.** I strongly believe that the US position is short-sighted in this case, and to align with it would mean thwarting efforts to build an autonomous, strategic, and resilient European pharmaceutical sector. Such a decision would strongly disincentivise private investors and would effectively undermine the European sector's ability to be a world leader in research. We must remember that the United States has contributed very marginally to the export of vaccine doses, unlike the European Union which has exported 200 million doses, as many as the US has administered to its own citizens. Suspending the patents is a very hypocritical decision. If the United States really wants to help eradicate the virus from the world, the only thing they have to do is **heavily subsidise, with public money, the production of a large number of vaccines by their pharmaceutical companies**. “Giving” the patent to these countries is a cynical way of appearing good and humanitarian, without contributing in any way to actually helping them.

# Case

#### There is no spare capacity that would be unlocked by IP waivers

Hans **Sauer 21,** Deputy General Counsel and Vice President for Intellectual Property for the Biotechnology Innovation Organization, “Waiving IP Rights During Times of COVID: A ‘False Good Idea’,” IPWatchdog, 4-19-2021, https://www.ipwatchdog.com/2021/04/19/waiving-ip-rights-during-times-of-covid-a-false-good-idea/id=132399/

The Proposed Waiver is Unlikely to Help the Fight Against the Pandemic To begin with, one would think, the burden of establishing the need for such an extreme and disruptive measure should be on its proponents. Yet, in the face of unprecedented progress towards COVID vaccines, tests and treatments in record time, the waiver proponents can point to no credible instances in which IP has in fact hindered the development or production of COVID-19 countermeasures. Readers should judge for themselves by perusing the joint South African/Indian TRIPS Council submission purporting to demonstrate such IP barriers. Even cursory inspection shows that this proof consists of a number of pending patent applications, a handful of patents that haven’t been asserted, a few statements by politicians, and historical narratives having nothing to do with COVID-19. There have been a few instances of patent litigation, but none to block or delay COVID products. Interestingly, royalty-free licenses by drug originators to dozens of manufacturers in developing countries are counted as IP barriers to access. Perhaps recognizing the lack of affirmative proof supporting the need for a COVID IP waiver, proponents are increasingly trying to shift the burden to those who oppose the waiver, maybe best exemplified by World Health Organization Director General Tedros Ghebreyesus’ stance: “if not now, then when would a WTO waiver ever be justified?” Yet this is a poor substitute for an actual rationale, especially when the TRIPS Agreement and its addenda are already replete with IP flexibilities that have been justified for both national and multilateral use on the ground that they will be necessary in a public health emergency. The same proponents who have for decades with significant traction argued for an ever-growing expansion of these flexibilities now say that it is not worth even trying to use them; only the effective abrogation of all IP rights in relation to COVID-19 would be a quick enough measure to deal with the present crisis while it lasts. However, the proposed blanket suspension of IP rights is no quick fix for the pandemic, as it is unlikely to accelerate the delivery of COVID-19 vaccines. Waiver proponents have been unable to document the existence of idle global COVID vaccine manufacturing capacity **that could be unleashed by suspending IP rights.** Existing capacity to produce traditional vaccines with conventional manufacturing technology simply cannot quickly or easily be converted to produce the advanced COVID-19 vaccines currently deployed. Thus, developing country manufacturers that currently make e.g. diphtheria, yellow fever, or tetanus vaccines, cannot simply be re-tooled to make the high-end mRNA or vectored COVID vaccines we are eagerly waiting for. Very different facilities will be needed, and getting these built, certified, and operational will take time, money, and precious expertise. Waiver proponents also seem to forget that someone must keep making the whooping cough, polio, MMR, and other childhood vaccines against diseases that kill more children in the developing world than COVID ever will. Current global need for non-COVID vaccines is estimated at 3.5-5.5 billion doses per year, and those who talk about using existing capacity must realize that we cannot convert current manufacturing away from these critically-important products. On top of that, an estimated 14 billion doses of COVID vaccines will be needed globally. As GAVI – The Vaccine Alliance explains, it was always clear that demand for COVID vaccines would be high, immediate, and impossible to meet in the short term. This is no fault of the IP system. Vaccine manufacturing processes are complex, require specific know-how and equipment, and just cannot happen overnight. Some COVID-19 vaccines involve new technologies, such as mRNA and lipid nanoparticle encapsulation, for which no large-scale manufacturing facilities or copious raw materials existed at the outset of the pandemic. The worldwide capacity to build or convert new plants is likewise limited, specialized manufacturing equipment is difficult or impossible to source, and none of this is or was ever going to be achievable within a few months as the proponents of the TRIPS waiver assert. Not even counting the time it takes to construct and equip a new plant, just the regulatory certification of a completed new facility takes several months before it can begin commercial production, and the manufacture and quality control of a single batch of COVID-19 vaccine takes 3-4 months before it can be released. Anywhere between 100 and 1,000 quality controls are done at each step of the manufacturing process. Those who argue that an IP waiver would enable the free flow of COVID vaccines within months are raising impossible expectations.

#### Empirics prove that pandemics do not lead to war – we are in the midst of one right now and there isn’t largfe scale global war

#### and

#### Disease doesn’t cause war

Dr. Barry R. Posen 20, Ford International Professor of Political Science at MIT and Director Emeritus of the MIT Security Studies Program, “Do Pandemics Promote Peace? Why Sickness Slows the March to War”, Foreign Affairs, 4/23/2020, https://www.foreignaffairs.com/articles/china/2020-04-23/do-pandemics-promote-peace

As the novel coronavirus infects the globe, states compete for scientific and medical supplies and blame one another for the pandemic’s spread. Policy analysts have started asking whether such tensions could eventually erupt into military conflict. Has the pandemic increased or decreased the motive and opportunity of states to wage war?

War is a risky business, with potentially very high costs. The historian Geoffrey Blainey argued in The Causes of War that most wars share a **common characteristic** at their outset: **optimism**. The belligerents usually start out sanguine about their odds of military success. When elites on both or all sides are confident, they are more willing to take the plunge—and less likely to negotiate, because they think they will come out better by fighting. Peace, by contrast, is served by **pessimism**. Even one party’s pessimism can be helpful: that party will be more inclined to negotiate and even accept an unfavorable bargain in order to avoid war.

When one side gains a sudden and pronounced advantage, however, this de-escalatory logic can break down: the optimistic side will increase its demands faster than the pessimistic side can appease. Some analysts worry that something like this could happen in U.S.-Chinese relations as a result of the new coronavirus. The United States is experiencing a moment of domestic crisis. China, some fear, might see the pandemic as playing to its advantage and be tempted to throw its military weight around in the western Pacific.

What these analysts miss is that COVID-19, the disease caused by the coronavirus, is **weaken**ing all of the great and middle powers more or less **equally**. None is likely to gain a meaningful advantage over the others. All will have ample reason to be pessimistic about their military capabilities and their overall readiness for war. **For the duration of** the **pandemic**, at least, and probably for years afterward, **the odds of a war between major powers will go down, not up**.

PAX EPIDEMICA?

A cursory survey of the scholarly **lit**erature on war and disease appears to confirm Blainey’s observation that pessimism is **conducive to peace**. Scholars have documented again and again how war creates permissive conditions for disease—in armies as well as civilians in the fought-over territories. But one **seldom** finds **any** discussion of **epidemics causing wars** or of wars deliberately started in the middle of widespread outbreaks of infectious disease. (The diseases that European colonists carried to the New World did weaken indigenous populations to the point that they were more vulnerable to conquest; in addition, some localized conflicts were fought during the influenza pandemic of 1919–21, but these were occasioned by major shifts in regional balances of power following the destruction of four empires in World War I.)

That **sickness slows the march to war** is partly due to the fact that **war depends on people**. When people fall ill, they can’t be counted on to perform well in combat. Military medicine made enormous strides in the years leading up to World War I, prior to which armies suffered higher numbers of casualties from disease than from combat. But pandemics still threaten military units, as those onboard U.S. and French aircraft carriers, hundreds of whom tested positive for COVID-19, know well. Sailors and soldiers in the field are among the most vulnerable because they are packed together. But even airmen are at risk, since they must take refuge from air attacks in bunkers, where the virus could also spread rapidly.

Ground campaigns in urban areas pose still greater dangers in pandemic times. Much recent ground combat has been in cities in poor countries with few or no public health resources, environments highly favorable to illness. Ground combat also usually produces prisoners, any of whom can be infected. A vaccine may eventually solve these problems, but an abundance of caution is likely to persist for some time after it comes into use.

The most important reason disease inhibits war is **economic**. Major outbreaks **damage national economies**, which are the **source** of military power. COVID-19 is a pandemic—by definition a worldwide phenomenon. All great and middle powers appear to be adversely affected, and all have **reason to be pessimistic about their military prospects**. Their economies are shrinking fast, and there is great uncertainty about when and how quickly they will start growing again.

### turn

#### Credible international trade undermines Chinese centralized involvement in the economy—hurts growth.

Zeng 2/7/13 (Ka, Professor of Political Science at University of Arkansas and co-author, most recently, of: Greening China: The Benefits of Trade and Foreign Direct Investment, “China, America and the WTO”, http://thediplomat.com/2013/02/china-america-and-the-wto/)

Growing tensions in U.S.-China trade relations generated by the rapid expansion of Chinese exports to the U.S. have led both countries to frequently resort to the World Trade Organization (WTO)’s dispute settlement mechanism (DSM). Noticeably, both Washington and Beijing seem to be more frequently using the DSM to target issues of critical concern to their respective domestic constituencies. While the U.S.’ WTO trade disputes against China tend to target Chinese industrial policy and challenge the dominance of state-owned enterprises (SOEs), cases involving antidumping duties (ADs) and countervailing duties (CVDs) have taken up a disproportionate share of China’s WTO disputes against the United States. Since its WTO accession, China has been the target of 29 WTO disputes initiated by its trading partners, with the United States accounting for the lion’s share of these cases. The Chinese measures being challenged by the United States include semiconductors, auto parts, intellectual property rights, trading rights and distribution services for certain products, grants and loans and, more recently, wind power equipment, renewable energy, and access to resources. Many of these cases involve the Chinese government supporting domestic enterprises through tariffs, subsidies, grants, refunds, and exemptions from taxes that either provided an unfair advantage to Chinese exporters, or restricted foreign market access in China. Washington's focus on Chinese industrial policy and the Chinese government’s continued support for domestic enterprises needs to be viewed against Beijing’s continued heavy involvement in the economy. Indeed, while economic reforms and WTO entry have streghtened the influence of free markets in China, the Chinese government has increased its reliance on industrial policy during the past decade. The 2008 global financial crisis, which led to a substantial contraction in China’s export markets, further reinforced the role of government stimulus spending, especially stimulus spending in the state sector, in ensuring the country’s sustained growth. As a liberal international economic institution, it is no surprise that the U.S. is using the WTO to target China’s state-centric model of development. If current trends continue the U.S. and other WTO members will continue to use the DSM to challenge China’s industrial policy and SOEs. These disputes will in turn raise important systemic issues for the organization regarding the impact of the state sector on trade flows and the ability of existing rules to cope with the challenges posed by large transitional economies such as China.

#### Large Chinese state-owned enterprises necessary for macroeconomic and political stability

Li October 2008 (Minqi, a Chinese political economist, world-systems analyst, and historical social scientist, currently an associate professor of Economics at the University of Utah, “Three Essays on China’s State Owned Enterprises: Towards an Alternative to Privatization”, http://content.csbs.utah.edu/~mli/CV/China\_State%20Owned%20Enterprises\_Book.pdf)

State owned enterprises are not only productive enterprises. They perform important social functions, providing education and medical and child care to their employees. In the mid-1990s, they operated more than 18,000 schools with an enrollment of 6.1 million students and 600,000 teachers and other staff. Hospitals built and run by state owned enterprises account for one-third of all hospital beds in China (Lardy 1998: 51). State owned enterprises were mostly founded in the 1950s-70s when all of their profits were submitted to the government, including the implicit pension funds of employees. However, since the early 1980s state owned enterprises have been required to be responsible for their own profits and losses, and the pension funds of their retired employees have to be paid out of retained earnings. With the ratio of retired employees to current employees rising steadily, the internal funds of many state owned enterprises have been depleted. In 1994, the retired employees amounted to 25 percent of the total current employees of the state owned enterprises. The pension payment of the state owned enterprises amounted to 56 percent of the profits of the state owned enterprises (Wei and Shen 1997; Jin 1997: 120-121). The social services provided by state owned enterprises and their pension payments are public functions that should have been performed by the government. To the extent that the government fails to perform these functions and the financial burden of these functions falls upon state owned enterprises, they are implicit taxes imposed upon state owned enterprises. Moreover, a proper measure of state owned enterprises’ output needs to take into account not only the part of the output that has a market value, but also the benefits of these social services. While state owned enterprises provide comprehensive welfare to their employees and are required by law to practice “democratic management” (meaning workers’ participation in management through congress of employees’ representatives, more on this below), non-state owned enterprises are notorious for their violation of labor rights and ruthless exploitation in the form of long working hours, low wages, and unsafe or otherwise detrimental working environments. A study on rural township and village enterprises (including enterprises owned “collectively” by township and village governments and rural private enterprises) observes that it is quite common for the management to arbitrarily extend working time and many township and village enterprises do not allow their employees to rest on weekends and public holidays (Xu 1995: 141). A 1992 nationwide survey found that 82 percent of town and village enterprises operated under conditions that had harmful effects on the physical health of workers. A 1988 research reported that town and village enterprises accounted for 50.1 percent of the total deaths related to professional diseases in the City of Shanghai. Many major industrial accidents took place in town and village enterprises (Xu 1995: 143). In foreign invested enterprises, it is not uncommon for the managers to beat, humiliate, and abuse employees. Workers are searched before they leave the workplace. They are forbidden to go to the restroom during work hours. Some manager punished workers by forcing the workers stand under the sun or in the rain for hours. Some even locked a worker in a cage with a dog (Qiao 1995: 166). Some foreign invested enterprises not only pay extremely low wages to production workers, but also arbitrarily deduct or delay workers’ wage payment or impose fines on workers. Many have their workers work nine or ten hours a day with no extra pay (Qiao 1995: 174). A survey by the Health Department of Guangdong Province found that over 70 percent of the foreign invested enterprises investigated did not have the necessary dust-prevention and poison-prevention equipment to protect their employees. In 1992, foreign invested enterprises accounted for 20 out of 80 major fire accidents in China. One of these accidents killed 84 workers. Since a Taiwanese enterprise was established in1989, 43 accidents had occurred, each of which had cost some worker’s hands or fingers (Qiao 1995: 176). The conditions in domestic private enterprises are no better. A study using the Marxist concept of surplus value found that in 1990, a typical private enterprise had a rate of surplus value of 587% (Qi and Xu 1995: 199). While the law requires private enterprises practice eight hour working day, a survey in four provinces found that 85 percent of private enterprises had their workers work longer than eight hour a day, and it was not uncommon for workers to work more than twelve hours a day. Some workers worked to death during the work. Like rural township and village enterprises and foreign invested enterprises, domestic private enterprises typically fail to provide the minimum safety conditions at workplace (Qi and Xu 1995: 200-201). The records of labor rights in non-state owned enterprises raise serious questions against their apparent “technical” efficiency. It is quite possible that controlling for labor right conditions, state owned enterprises are actually more efficient. The failure of the government to enforce labor laws in non-state owned enterprises has amounted to implicitly subsidizing non-state owned enterprises. Non-state owned enterprises are allowed to prevail in competition with state owned enterprises by paying low to workers, forcing workers to work long hours, and saving on necessary safety expenses. In the reform period, the managers of state owned enterprises have been provided increasing autonomy with respect to the government. Moreover, the manager has acquired the power to hire and fire workers and to decide wage distribution. As a result, the balance of power between workers and management has been turned decisively in favor of management (Zhao 1995: 83). While the managers have acquired more power, the process of privatization has created enormous profit opportunities that induce the managers to abuse their power. They move assets out of state owned enterprises into newly founded non-state owned enterprises, which often become their own property. Alternatively, they lease or contract out state assets but the profits or interest payments never flow back to the state owned enterprise. One government office estimated that between 1987 and 1992, the annual loss of asset stripping from state owned enterprises amounted to 33 billion Yuan. A later estimate found that between 1990 and 1995 the annual loss rose to 50 billion Yuan (Lardy 1998: 51-52). In the privatization wave in the mid-1990s, in which tens of thousands of small state owned enterprises were privatized, the asset stripping problem became perceptibly worse (He 1998: 106-116). A leading Chinese economist, Hu Angang, recently estimated that the annual loss of public investment and public expenditure funds caused by corruption amounts to 257.5 to 341 billion Yuan (World Journal or Shijie Ribao, March 24, 2001). 6. Towards an Alternative to Privatization A comprehensive evaluation of the performance of state owned enterprises must not be restricted to microeconomic indicators. Arguably, a state sector has important positive externalities on the rest of the economy. State owned enterprises produce public goods, offer goo

ds and services in natural monopoly industries without pursuing monopoly profits, function as model enterprises in protecting workers’ interests and the environment, lead the development of strategic industries, and helps to stabilize the macro-economy. There is some empirical evidence that higher share of state owned enterprises in the economy is associated with a higher economic growth rate (Doamekpor 1998). The experience of privatization in developing and transition economies suggests that privatization is not likely to be a good approach if the purpose of economic reform is to improve the performance of state owned enterprises and the performance of the economy as a whole. Given the fact that political and economic power is concentrated in a small group of elites, privatization provides an opportunity for the elites to break previously established social contracts with certain sections of working people and to profit from the process of privatization at the expense of the public interest. Thus, privatization is often associated with large-scale corruption, the looting of state assets, and rapid increases in inequality. For several reasons, privatization has failed to contribute to better economic performance. First, the new owners of the previously state owned assets are often not competent in productive management. Moreover, they are often more interested in selling the assets for quick profit and sending the money abroad where their illegitimately acquired assets would be safe, than in the productive management of these assets. Secondly, the breakdown of the previously established social contracts associated with the process of privatization results in a general loss of previously developed “social and organization capital,” and causes a decline of the society’s productive capability. Thirdly, the political instability associated with the distributive conflicts that arise in the process of privatization increases economic risks and discourages investment. Fourthly, where the privatized assets are put in productive use, they may be operated in a way that enhances private profit at the expense of the public interest. This is more likely to be the case in natural monopolistic industries (Green 1995: 72-76; Stiglitz 1999; Farazmand 2001: 13-14).8 If state owned enterprises serve important social and economic functions that cannot be performed by private enterprises, and privatization is not likely to be the right solution to the economic problems in developing and transition economies, an alternative to wholesale privatization has to be developed. This monograph argues that in the Chinese context, a large state owned enterprise sector is necessary for maintaining macroeconomic stability. It also argues that the performance of state owned enterprises can be significantly improved with more workers’ participation in management and a government policy that is committed to sufficient level of aggregate demand. The body of this monograph consists of three essays. In Chapter 2, I argue that a large state owned enterprise sector has made an important contribution to macroeconomic stability in the Chinese context. John Maynard Keynes pointed out that a market economy is fundamentally unstable and a large public sector is indispensable for a modern complex economy to sustain reasonable economic performance in the long run. Hyman P. Minsky argued that in the context of the U.S. economy, the federal government needed to be as large as about 20 percent of GDP to maintain macroeconomic stability and avoid severe economic downturns. This essay applies Minsky’s hypothesis to the Chinese context. It argues that public sector investment (primarily investments made by state owned enterprises) has played a crucial role in macroeconomic stabilization and the state owned enterprise sector needs to be sufficiently large so that the public sector investment accounts for about 50 percent of the total capital formation.

#### CCP instability causes extinction.

Perkinson 12 — Jessica, Faculty of the School of International Service of American University in Partial Fulfilment of the Requirements for the Degree of Master of Arts in International Affairs; reviewed by: Quansheng Zhao, Professor of international relations and Chair of Asian Studies Program Research Council at American University, and John C. King, Assistant Professor School of International Service, 2012 (“The Potential for Instability in the PRC: How the Doomsday Theory Misses the Mark,” American University, April 19th, Available Online at http://aladinrc.wrlc.org/bitstream/handle/1961/10330/Perkinson\_american\_0008N\_10238display.pdf?sequence=1)

Should the CCP undergo some sort of dramatic transformation – whether that be significant reform or complete collapse, as some radical China scholars predict2 – the implications for international and US national security are vast. Not only does China and the stability of the CCP play a significant role in the maintenance of peace in the East Asian region, but China is also relied upon by many members of the international community for foreign direct investment, economic stability and trade. China plays a key role in maintaining stability on the Korean Peninsula as one of North Korea’s only allies, and it is argued that instability within the Chinese government could also lead to instability in the already sensitive military and political situation across the Taiwan Strait. For the Unite

d States, the effect of instability within the CCP would be widespread and dramatic. As the United States’ largest holder of US treasury securities, instability or collapse of the CCP could threaten the stability of the already volatile economic situation in the US. In addition, China is the largest trading partner of a number of countries, including the US, and the US is reliant upon its market of inexpensive goods to feed demand within the US.

It is with this in mind that China scholars within the United States and around the world should be studying this phenomenon, because the potential for reform, instability or even collapse of the CCP is of critical importance to the stability of the international order as a whole. For the United States specifically, the potential - or lack thereof - for reform of the CCP should dictate its foreign policy toward China. If the body of knowledge on the stability of the Chinese government reveals that the Chinese market is not a stable one, it is in the best interests of the United States to look for investors and trade markets elsewhere to lessen its serious dependence on China for its economic stability, particularly in a time of such uncertain economic conditions within the US.