**DA – Innovation**

**The US commercial space industry is booming – private space companies are driving innovation.**

**Lindzon 21** [(Jared Lindzon, A FREELANCE JOURNALIST AND PUBLIC SPEAKER BORN, RAISED AND BASED IN TORONTO, CANADA. LINDZON'S WRITING FOCUSES ON THE FUTURE OF WORK AND TALENT AS IT RELATES TO TECHNOLOGICAL INNOVATION) "How Jeff Bezos and Elon Musk are ushering in a new era of space startups," Fast Company, 2/23/21, <https://www.fastcompany.com/90606811/jeff-bezos-blue-origin-elon-musk-spaces-space>] TDI

In early February, Jeff Bezos, the founder of Amazon and one of the planet’s wealthiest entrepreneurs, dropped the bombshell announcement that he would be stepping down as CEO to free up more time for his other passions. Though Bezos listed a few targets for his creativity and energy—The Washington Post and philanthropy through the Bezos Earth Fund and Bezos Day One Fund—one of the highest-potential areas is his renewed commitment and focus on his suborbital spaceflight project, Blue Origin. Before space became a frontier for innovation and development for privately held companies, opportunities were limited to nation states and the private defense contractors who supported them. In recent years, however, billionaires such as Bezos, Elon Musk, and Richard Branson have lowered the barrier to entry. Since the launch of its first rocket, Falcon 1, in September of 2008, Musk’s commercial space transportation company SpaceX has gradually but significantly reduced the cost and complexity of innovation beyond the Earth’s atmosphere. With Bezos’s announcement, many in the space sector are excited by the prospect of those barriers being lowered even further, **creating a new wave of innovation in its wake.** “What I want to achieve with Blue Origin is to build the heavy-lifting infrastructure that allows for the kind of dynamic, entrepreneurial explosion of thousands of companies in space that I have witnessed over the last 21 years on the internet,” Bezos said during the Vanity Fair New Establishment Summit in 2016. During the event, Bezos explained how the creation of Amazon was only possible thanks to the billions of dollars spent on critical infrastructure—such as the postal service, electronic payment systems, and the internet itself—in the decades prior. “On the internet today, two kids in their dorm room can reinvent an industry, because the heavy-lifting infrastructure is in place for that,” he continued. “Two kids in their dorm room can’t do anything interesting in space. . . . I’m using my Amazon winnings to do a new piece of heavy-lifting infrastructure, which is low-cost access to space.” In the less than 20 years since the launch of SpaceX’s first rocket, space has gone from a domain reserved for nation states and the world’s wealthiest individuals to everyday innovators and entrepreneurs. Today, building a space startup isn’t rocket science. THE NEXT FRONTIER FOR ENTREPRENEURSHIP According to the latest Space Investment Quarterly report published by Space Capital, the fourth quarter of 2020 saw a record $5.7 billion invested into 80 space-related companies, bringing the year’s total capital investments in space innovation to more than $25 billion. Overall, more than $177 billion of equity investments have been made in 1,343 individual companies in the space economy over the past 10 years. “It’s kind of crazy how quickly things have picked up; 10 years ago when SpaceX launched their first customer they removed the barriers to entry, and we’ve seen all this innovation and capital flood in,” says Chad Anderson, the managing partner of Space Capital. “We’re on an exponential curve here. Every week that goes by we’re picking up the pace.”

**The plan creates a restriction that encourages companies to move their operations to states with lower standards.**

**Albert 14** [(Caley Albert, J.D. Loyola Marymount University) “Liability in International Law and the Ramifications on Commercial Space Launches and Space Tourism,” Loyola of Los Angeles International and Comparative Law Review, 11/1/14, <https://digitalcommons.lmu.edu/cgi/viewcontent.cgi?article=1708&context=ilr>] TDI

A parallel can be drawn here between the commercial space industry and the maritime law concept of the Flag of Convenience. The term has evolved over time, but in this day and age, it is commonly used to mean the owner of a vessel does not want to create an obligation with a country with stricter standards for registry; hence, the owner will register strictly for economic reasons with a country that has a more convenient registry.133 By flying a Flag of Convenience, ship owners are able to avoid taxation on earnings of ships registered under these flags, and in some cases, they can also receive relief from stricter crew standards and corresponding operating costs.134 A Flag of Convenience is flown by a vessel that is registered in one state, which the vessel has little if any connection to, when in reality the vessel is owned and operated from another state.135 This way the vessel avoids any unfavorable economic requirements from its true home state.136 In this sense, “flag shopping” is similar to “launch forum shopping,” similar in that Flags of Convenience are utilized for economic reasons, such as to **avoid** high taxes and **compliance with certain restrictive** international **conventions**, commercial space companies will forum shop when choosing which country to launch from. As of today, there has yet to be a catastrophic commercial launch incident, so for now commercial space companies do not have an incentive to forum shop, but if there is, the indemnification policies described above may lead companies to seek out countries that provide more coverage so they pay less in the event something goes wrong. This comparison to Flags of Convenience brings up two separate yet equally important issues. First, launch companies may try to follow the Flags of Convenience model and soon catch on to the wisdom of their maritime predecessors by “registering” in countries with more favorable conditions. Of course, in this case the concern is not with registration so much as launching. If launch companies follow the Flags of Convenience model, they will seek out the most convenient state for launch, most likely the state that provides the most liability coverage and has the least safety precautions. Launching from states with low safety standards increases the potential for catastrophic launch events. This, in turn, will place states that are potentially incapable of paying for damages from launch disasters in a position they would not normally assume if these commercial companies had not been drawn to their shores with the promise of more favorable regulations. Second, launch customers may also seek out companies located in states with lower cost liability regimes (lower insurance policy limits) since those companies will presumably charge less to launch their payloads. In this scenario, instead of the launch companies seeking out states with lower liability caps and softer regulations, the launch customers themselves will seek companies located in states with lowcost liability regimes. Here, the effect will be the same as above. Under the Liability Convention, the launching state will be liable for any damage caused by a vehicle launched from within its borders; hence, if customers start engaging in “launch forum shopping,” states will be incentivized to put in place low-cost liability regimes, which in turn will increase the states’ potential payout in the event of a catastrophic launch incident. Looking at the indemnification program the United States has in place in comparison to other countries, it is possible to see how either launch companies or launch customers could engage in “launch forum shopping” when a catastrophic launch incident ever occur. It is also important to keep in mind that various factors go into where a company or customer decides to launch from. A state’s indemnification program is just one factor in this decision. With this in mind, it is clear that if a launch incident did occur in the United States, the commercial launch company would be liable for much more than it would in another country. For instance, why would a commercial space company launch in the United States, where it would be liable up to $500 million and the additional costs that the government would not cover? The argument can be made that a catastrophic space incident has yet to occur, and even if it did, it is unlikely to cost above the $2.7 billion covered by the United States government. **Other states like Russia or France, which has the two-tier liability system, would simply cover all claims above the initial insurance**, which is much lower than the $500 million mark required by the United States. In that case, the commercial company would never have to pay more than the initial liability insurance. If there ever is a catastrophic commercial space incident in the future, it is easy to see why commercial companies or launch customers might be drawn to “launch forum shop” **outside the United States**.

**Maintaining US space dominance requires a homegrown commercial space industry – private companies offshoring gives China the advantage they need.**

**Cahan and Sadat 21** [(Bruce Cahan, J.D) (Dr. Mir Sadat, ) "US Space Policies for the New Space Age: Competing on the Final Economic Frontier," based on Proceedings from State of the Space Industrial Base 2020 Sponsored by United States Space Force, Defense Innovation Unit, United States Air Force Research Laboratory, 1/6/21, <https://www.politico.com/f/?id=00000177-9349-d713-a777-d7cfce4b0000>] TDI

Today, China’s commercial space sector is in its infancy but is set to grow with continued national and provincial support, which have been rapidly increasing over the past three years.64 Since 2004, the United States and China accounted for 74% of the $135.2 billion venture capital (VC) invested in commercial space. 65 The early 2020s are pivotal, as **it would be far cheaper for China and Chinese commercial space firms to acquire space technologies from the United States or allied nation companies seeking revenues or facing cashflow constraints**, than to build the companies and their teams and technologies from scratch in China. The tight coupling of Chinese military goals and an economy organized to achieve those goals magnifies the economic threats and market disruptions that the United States must immediately address, in order for DoD and national security operations to rely on US commercial space capabilities. 3. ISSUES AND CHALLENGES Peaceful Uses of Space and Space Exploration Space has been primarily a shared, not a warfighting, domain.67 With each passing second of Planck time,68 space enables a modern way of life, provides instantaneous global imagery, assures telecommunications, and captures humanity’s imagination for civil space exploration. As a result, space is a burgeoning marketplace and territory for commercial ventures and investors. **Strengthening the US commercial space industrial base is vital to and beyond US national security**. Civil space activities are a source of US “soft power” in global commerce, cooperation, and investment. 69 The civil space sector, led by NASA, is **fundamental to America’s national security**. 70 NASA is on an ambitious critical path to return to the Moon by 2024,71 along with developing the capabilities and infrastructure for a sustained lunar presence. NASA’s lunar plans provide a lunar staging area for missions to Mars and beyond. They offer a strategic and economic presence for the United States on the Moon. Congress, the White House, DoD, and NASA must recognize that economic and strategic dominance in service of national security requires catalyzing and accelerating growth of a vibrant, **private US industrial** and cultural **expansion into the Solar System.** Human visitation and eventual settlement beyond the Earth require sustaining visionary leaders, aided by, and aiding, US national security. **A recurring theme in US policy is “maintaining and advancing United States dominance and strategic leadership in space” because US global competitors and adversaries are competent and capable of outpacing American space capabilities.** 72 The stakes are high: At this historic moment, there is a real race for dominance over cislunar access and resources.Regulations Should Foster US Commercial Space as a National AssetLeveraging the reimagination and disruption of terrestrial industries, the US commercial space industry is pushing the frontiers of the United States and global space economics and capabilities. A pre-COVID19 assessment by the US Chamber of Commerce projected that the US space market will increase from approximately $385 billion in 2020, to at least $1.5 trillion by 2040. 73 This projection represents a seven percent (7%) annual compound average growth rate (CAGR), driven largely by expanded business opportunities in Low Earth Orbit (LEO). Total addressable market (TAM) for US commercial space companies could be far larger were they to have federal and financial support for initiating cislunar space operations and opportunities. Recent advancements in commercial space technologies and business models have driven down costs and unlocked new areas of economic growth and space capabilities that outpace and de-risk acquiring capabilities through traditional US government economic development, research and development (R&D), procurement and regulatory policies and processes. **US regulations must ensure that US companies lead in commercial space.** In specific, technological advances that lower access costs and expand space mission capabilities, content, continuity, and redundancies must be fully supported by or incorporated into US government programs, budgets, requirements, and acquisition processes. Until commercial space offerings are fully incorporated, and federal acquisition policies and personnel commit to innovation, US government fiscal buying power, intelligence and program support will lag and remain inadequate in comparison to US private sector companies and the nation’s global competitors and adversaries in space. Addressing COVID-19’s Impact on US Commercial Space The COVID-19 pandemic damaged and still challenges the US space industrial base. US domestic investors’ funding of space R&D remains inconsistent across the lifecycle of New Space companies and the spectrum of technologies necessary to grow the space economy. To date, public R&D, government procurements and visionary space entrepreneurs have played a major role in establishing and funding the New Space industrial base. In the last five years, $11 billion of private capital has been invested.74 Traditional private investors may become reluctant to fund space technologies due to perceptions of higher risk over longer time horizons before receiving profitable returns on their capital. Institutional and long-horizon investors who manage patient capital have an appetite for illiquid, but higher yielding, terrestrial alternative asset investments such as commodities, private equity limited partnerships and real estate.75 The COVID-19 pandemic has created economic uncertainties making the New Space’s funding model unreliable. COVID-19 significantly impacted venture capital (VC)-backed companies: the pace of VC space investments fell 85% between April - June, as compared to January – March, in 2020. 76 Pre-COVID-19, the New Space industrial base confronted multiple challenges in raising later stages of venture capital such as (1) the lag between having an early-stage startup with an idea and commercializing a viable revenue-generating product, (2) the lack of market liquidity for founder and private equity space investments to attract and retain talented teams, and (3) the lack of a market to re-sell contracts for space goods and services when customers buy more capacity than needed. Even prior to the COVID-19 pandemic, federal financing of US R&D was at a historically minor level, as compared to businesses and universities.77 US government support for basic research has steadily declined as a percent of GDP. The federal government will experience near- to medium-term budget constraints.78 The vibrant venture community in the United States has taken up a portion of this slack by increasing R&D investment in later-stage and applied research. However, founding teams and VC financing rely on government to fund earlier R&D for basic science and engineering. Therefore, government must resume the sustainable and impactful past levels of support for basic research, an essential role in the space economy’s public-private partnership that ensures US leadership in space. Space as Existential Terrain for National Security In this Digital Era, **space** integrates and **drives all elements of US national security**. The Cold War may be over, but since the early 2010s**, a renewed era of great power competition has emerged** across terrestrial land, air, sea, and cyber domains. **This competition extends into space,** where a great game ensues.79 Space is no longer an uncontested or sanctuary domain. Competent and **capable global competitors and peer adversaries are challenging US military**, commercial, and civil space interests. The United States, along with its allies and partners, has had to accept and anticipate that **space may be a warfighting domain**, as suggested primarily by Russian and Chinese counter-space capabilities, military operations, and declarative statements. On December 20, 2019, the bipartisan National Defense Authorization Act (NDAA) for Fiscal Year 202080 authorized the creation of the US Space Force, under the Department of the Air Force, to secure US national interests in an increasingly contested domain.81 Back in October 1775, the Continental Congress established the US Navy to ensure that commercial and government fleets could freely navigate the Atlantic coastline - today, that includes the South China Sea. Likewise, the USSF’s mission is to ensure unfettered access to and the freedom to operate in space. The 2017 National Security Strategy considers space to be a “priority domain.”82 Freedom of navigation is a sovereign right that nations have fought to achieve and defend. 83 The USSF’s main role is to organize, train and equip, as well as to protecting US space interests and supporting terrestrial and joint warfighters (e.g., US Space Command). Thus, USSF must secure US national interests in space, whether military, commercial, scientific, civil, or enhancing US competitiveness for cislunar leadership.

**US space dominance prevents global war**

**Zubrin 15** [(Robert Zubrin, president of Pioneer Energy, a senior fellow with the Center for Security Policy) “US Space Supremacy is Now Critical,” Space News, 1/22/15, <https://spacenews.com/op-ed-u-s-space-supremacy-now-critical/>] TDI

The United States needs a new national security policy. For the first time in more than 60 years, we face the real possibility of a large-scale conventional war, and we are woefully unprepared. Eastern and Central Europe is now so weakly defended as to virtually invite invasion. The United States is not about to go to nuclear war to defend any foreign country. So deterrence is dead, and, with the German army cut from 12 divisions to three, the British gone from the continent, and American forces down to a 30,000-troop tankless remnant, the only serious and committed ground force that stands between Russia and the Rhine is the Polish army. It’s not enough. Meanwhile, in Asia, the powerful growth of the Chinese economy promises that nation eventual overwhelming numerical force superiority in the region. How can we restore the balance, creating a sufficiently powerful conventional force to deter aggression? It won’t be by matching potential adversaries tank for tank, division for division, replacement for replacement. Rather, **the United States must seek to totally outgun them by obtaining a radical technological advantage. This can be done by achieving space supremacy.** To grasp the importance of space power, some historical perspective is required. Wars are fought for control of territory. Yet for thousands of years, victory on land has frequently been determined by dominance at sea. In the 20th century, victory on both land and sea almost invariably went to the power that controlled the air. In the 21st century, victory on land, sea or in the air will go to the power that controls space. The critical military importance of space has been obscured by the fact that in the period since the United States has had space assets, all of our wars have been fought against minor powers that we could have defeated without them. Desert Storm has been called the first space war, because the allied forces made extensive use of GPS navigation satellites. However, if they had no such technology at their disposal, the end result would have been just the same. This has given some the impression that space forces are just a frill to real military power — a useful and convenient frill perhaps, but a frill nevertheless. But consider how history might have changed had the Axis of World War II possessed reconnaissance satellites — merely one of many of today’s space-based assets — without the Allies having a matching capability. In that case, the Battle of the Atlantic would have gone to the U-boats, as they would have had infallible intelligence on the location of every convoy. Cut off from oil and other supplies, Britain would have fallen. On the Eastern front, every Soviet tank concentration would have been spotted in advance and wiped out by German air power, as would any surviving British ships or tanks in the Mediterranean and North Africa. In the Pacific, the battle of Midway would have gone very much the other way, as the Japanese would not have wasted their first deadly airstrike on the unsinkable island, but sunk the American carriers instead. With these gone, the remaining cruisers and destroyers in Adm. Frank Jack Fletcher’s fleet would have lacked air cover, and every one of them would have been hunted down and sunk by unopposed and omniscient Japanese air power. With the same certain fate awaiting any American ships that dared venture forth from the West Coast, Hawaii, Australia and New Zealand would then have fallen, and eventually China and India as well. With a monopoly of just one element of space power, the Axis would have won the war. But modern space power involves far more than just reconnaissance satellites. The use of space-based GPS can endow munitions with 100 times greater accuracy, while space-based communications provide an unmatched capability of command and control of forces. Knock out the enemy’s reconnaissance satellites and he is effectively blind. Knock out his comsats and he is deaf. Knock out his navsats and he loses his aim. In any serious future conventional conflict, even between opponents as mismatched as Japan was against the United States — or Poland (with 1,000 tanks) is currently against Russia (with 12,000) — **it is space power that will prove decisive. Not only Europe, but the defense of the entire free world hangs upon this matter.** For the past 70 years, U.S. Navy carrier task forces have controlled the world’s oceans, first making and then keeping the Pax Americana, which has done so much to secure and advance the human condition over the postwar period. But should there ever be another major conflict, an adversary possessing the ability to locate and target those carriers from space would be able to wipe them out with the push of a button. For this reason, it is imperative that the United States possess space capabilities that are so robust as to not only assure our own ability to operate in and through space, but also be able to **comprehensively deny it to others.** Space superiority means having better space assets than an opponent. Space supremacy means being able **to assert a complete monopoly** of such capabilities. **The latter is what we must have**. If the United States can gain space supremacy, then the capability of any American ally can be multiplied by orders of magnitude, and with the support of the similarly multiplied striking power of our own land- and sea-based air and missile forces be made so formidable as to render any conventional attack unthinkable. On the other hand, should we fail to do so, we will remain so vulnerable as to increasingly invite aggression by ever-more-emboldened revanchist powers. This battle for space supremacy is one we can win. Neither Russia nor China, nor any other potential adversary, can match us in this area if we put our minds to it. We can and must develop ever-more-advanced satellite systems, anti-satellite systems and truly robust space launch and logistics capabilities. Then the next time an aggressor commits an act of war against the United States or a country we are pledged to defend, instead of impotently threatening to limit his tourist visas, we can respond by taking out his satellites, effectively informing him in advance the certainty of defeat should he persist. **If we desire peace on Earth, we need to prepare for war in space.**

**1NC – T/L**

**Text: The appropriation of outer space by private entities based in the United States is just. The appropriation of outer space by all other private entities is unjust.**

**Private space appropriation is *amazing*! US investment solves warming, heg, and leads to massive space tech innovation which solves space colonization.**

**Harrison 1/07/22 @11:30 EST** [Richard, vice president of operations and director of defense technology programs at the American Foreign Policy Council (AFPC) in Washington, D.C. He serves as co-director of the AFPC Space Policy Initiative and editor of its Space Strategy Podcast, “Space: One important thing that might retain bipartisan focus”, 01-07-2022, The Hill, [https://thehill.com/opinion/technology/588708-space-one-important-thing-that-might-retain-bipartisan-focus]//pranav](https://thehill.com/opinion/technology/588708-space-one-important-thing-that-might-retain-bipartisan-focus%5D//pranav)

These days, **despite the hyper-partisan atmosphere in Washington, there still seem to be two issues that both Democrats and Republicans can agree on.** One is the pervasive threat posed by the People’s Republic of China. **The other is the overarching importance of space**.

When **Vice President Kamala Harris chaired the Biden administration’s first National Space Policy Council meeting last month, her comments — along with the simultaneously released U.S. Space Priorities Framework — largely echoed the space policy launched by the Trump administration**. That was not necessarily a given, since a continuation of policy is never a guarantee during presidential transitions. **But the Biden administration’s acknowledgement is great news for the rekindling of America’s space program and strategy**.

The emphasis is logical. Although news about space is all too often dominated by headlines of the latest Russian anti-satellite test or milestone in China’s space program, **the domain is already ubiquitous — and essential — for daily life.** We rely on space for our financial transactions, daily navigation, weather notifications, TV services, and telecommunications. Today, the global space economy is estimated at $450 billion annually — a figure that has doubled over the previous decade. This, however, is just the beginning. **The economic value of space is poised to soar, entering the trillions annually over the course of the next two decades.**

**What is driving this economic expansion? The short answer is reusable rockets**. **While some have been critical of the so-called “billionaire space race,” companies like SpaceX have made the domain more accessible by drastically reducing the costs associated with bringing items into space (an 85 percent reduction over the last 20 years). Critics may not want to admit it, but the visionaries who are pursuing dreams of humans becoming a multiplanetary species are indeed pushing civilization forward — and helping to solve some of our most pressing problems in the process**.

**Climate change is one.** **As countries scramble to find ways to reduce dependency on carbon fuels, space holds out promise in the form of an unlimited power source: the Sun.** Unlike Earth-based solar panels on houses and buildings, which have limited access to sunlight due to cloud cover and nighttime, **space-based solar power (SSP) relies on satellites with large solar arrays that can collect sunlight 24/7 and beam that energy to Earth in the form of microwaves that are then converted to electricity**. **The U.S. military already has a number of SSP projects underway at facilities like the Naval Research Laboratory and Air Force Research Laboratory**, but the real game changer will be if SSP can be scaled up for civilian and commercial use.

**To do so, however, will require construction of incredibly large satellites — an expensive and cumbersome endeavor, at least on Earth. Thanks to gravity, getting such payloads into low Earth orbit burns up large quantities of propellant, making space launches a costly endeavor**. But, here too, **space can help. If SSP satellites can be assembled in space (from materials gathered from the Moon or asteroids), the construction process would be far more efficient, and considerably cheaper.** Moreover, although it sounds a bit like science fiction, **space, asteroid and Lunar mining could provide a new and virtually limitless supply of the coveted rare Earth elements that are essential components in modern communication and weapon systems — not to mention generating trillions of dollars of precious metals, and materials to create space fuel.**

**The private sector push for power, mining, and in-space fabrication will also foster advancement in artificial intelligence and robotics.** Improvements in these fields will reduce the cost for on-orbit servicing in space — meaning that **satellites currently in orbit can stay functional for longer periods of time as satellites dedicated to repair and refueling are developed (a process that is already underway).**

**Space-based innovations benefiting the public are hardly a new phenomenon**. Over the years, NASA has produced numerous spinoffs in the course of its primary mission of space exploration. Neither has the success of the International Space Station (ISS) and the potential for experimentation in near zero gravity gone unnoticed. **As the ISS prepares to sunset in 2030, several U.S. companies have already made plans to build follow-on space stations.** **The benefits of microgravity on the new stations will help the medical field 3D print human organs and allow pharmaceutical firms to create new drugs. Developing medicine in space, in turn, will translate into opportunities for astronauts to go on longer space missions, and so on.**

Meanwhile, space tourism has arrived. Jeff Bezos’ Blue Origin and Richard Branson’s Virgin Galactic have done a good deal more than simply send celebrities into space. They have demonstrated that space missions are no longer limited to highly trained astronauts. **As the private sector continues to innovate, longer-term human presence in space will invariably necessitate support services, including communication satellites and space-based internet. All of these developments will contribute to a burgeoning space economy of unbounded potential.**

The U.S. thus finds itself at a critical juncture.

With the proper vision and investment, **America has the potential to become a leader in the space economy. But doing so will require serious investments from industry,** and a mandate from policymakers to harness this renewed interest in space, irrespective of what party happens to be in power in Washington. **That we are now heading in such a direction is good news indeed.**

**Warming causes extinction & turns every impact – no adaptation & each degree is worse**

**Krosofsky ’21** [Andrew, Green Matters Journalist, “How Global Warming May Eventually Lead to Global Extinction”, Green Matters, 03-11-2021, [https://www.greenmatters.com/p/will-global-warming-cause-extinction]//pranav](https://www.greenmatters.com/p/will-global-warming-cause-extinction%5D//pranav)

Eventually, yes. **Global warming will invariably result in the mass extinction of millions of different species,** humankind included. In fact, **the Center for Biological Diversity says that global warming is currently the greatest threat to life on this planet**. **Global warming causes a number of detrimental effects on the environment that many species won’t be able to handle long-term**. Extreme weather patterns are shifting climates across the globe, eliminating habitats and altering the landscape. **As a result, food and fresh water sources are being drastically reduced**. Then, of course, **there are the rising global temperatures themselves, which many species are physically unable to contend with**. Formerly frozen arctic and antarctic regions are melting, increasing sea levels and temperatures. Eventually, **these effects will create a perfect storm of extinction conditions**. The melting glaciers of the arctic and the searing, **unmanageable heat indexes being seen along the Equator are just the tip of the iceberg, so to speak.** **The species that live in these climate zones have already been affected by the changes caused by global warming.** Take polar bears for example, whose habitats and food sources have been so greatly diminished that they have been forced to range further and further south. **Increased carbon dioxide levels in the atmosphere and oceans have already led to ocean acidification**. **This has caused many species of crustaceans to either adapt or perish and has led to the mass bleaching of more than 50 percent of Australia’s Great Barrier Reef**, according to National Geographic. According to the Center for Biological Diversity, the current trajectory of global warming predicts that more than 30 percent of Earth’s plant and animal species will face extinction by 2050. By the end of the century, that number could be as high as 70 percent. We won’t try and sugarcoat things, humanity’s own prospects aren’t looking that great either. According to The Conversation, **our species has just under a decade left to get our CO₂ emissions under control. If we don’t cut those emissions by half before 2030, temperatures will rise to potentially catastrophic levels. It may only seem like a degree or so, but the worldwide ramifications are immense.** The human species is resilient. We will survive for a while longer, even if these grim global warming predictions come to pass, **but it will mean less food, less water, and increased hardship across the world — especially in low-income areas and developing countries. This increase will also mean more pandemics, devastating storms, and uncontrollable wildfires**.

**American military power is the sole deterrent of nuclear war – hegemony is key**

**Jones 18** [Seth G. Jones holds the Harold Brown Chair and is director of the Transnational Threats Project at the Center for Strategic and International Studies (CSIS), “The Future of Warfare is Irregular,” 8/26/18, <https://nationalinterest.org/feature/future-warfare-irregular-29672>] sg

AMONG THE Trump administration’s most significant national security decisions has been the shift from counterterrorism to inter-state competition. The United States is increasingly engaging in global rivalry with “revisionist” states like China, Russia, Iran and North Korea. To do this well, some U.S. policymakers have argued that the United States needs to develop capabilities to fight—and win—conventional and possibly even nuclear wars against these states if deterrence fails. As the National Defense Strategy argues, “The surest way to prevent war is to be prepared to win one. Doing so requires a competitive approach to force development and a consistent, multiyear investment to restore warfighting readiness and field a lethal force.” While there are good reasons to focus U.S. national security on balancing against global and regional state adversaries, **it would be a mistake to assume that most future conflict will be conventional or even nuclear**. It won’t. **The United States remains the world’s preponderant military power**. **For** Russia, Iran, North Korea and even **China, conventional or nuclear war with the United States would be risky and prohibitively costly**. What’s more, America’s struggles in Afghanistan and Iraq suggest that the U.S. military is vulnerable when faced with adversaries that resort to irregular strategies, operations and tactics. These realities suggest that competition between the United States and its main adversaries will likely be irregular—not conventional. Russia will likely continue to focus on a suite of overt and covert actions, from supporting state and nonstate proxies in Syria, Ukraine and potentially the Baltics to information warfare. Iran will attempt to expand its power through proxies in Lebanon, Syria, Iraq, Yemen, Afghanistan and Bahrain—not by amassing a more potent army, navy or air force capable of fighting conventional battles against the United States. China is already spreading its influence in the Pacific by utilizing economic coercion, conducting a sophisticated information campaign, and resorting to fishing vessels and other “grey zone” tactics to lay claim to islands. Even North Korea will likely continue to develop its special operations and cyber capabilities.The future of conflict means that the United States needs to prepare to compete with these states not primarily with divisions, aircraft carriers and strategic bombers—but by, with, and through state and nonstate proxies, cyber tools, and overt and covert information campaigns. At the moment, however, the United States is ill-prepared for irregular competition. WHILE THE United States needs to prepare for the possibility of conventional and nuclear war, neither will likely be the primary means of competition for at least two reasons. First, **the United States remains the dominant global military power**. Its defense budget is still larger than the defense budgets of the next eleven countries in the world combined. More importantly, **the United States’ land, air, naval, space and cyber capabilities are formidable**. For Russia, Iran, North Korea and even China, conventional or **nuclear war with the United States would be risky**. The gap between the United States and China, in particular, is narrowing. Beijing is developing more accurate, long-range missiles; integrated air defense; fourth-generation fighter aircraft; enhanced naval power projection; more advanced space and counterspace capabilities; and nuclear forces, including a new generation solid-propellant intercontinental ballistic missile, the df-41. But **U.S. military capabilities surpass those of its competitors.** Second, the costs of conventional and nuclear war are likely to be staggering. Over the past several years, the U.S. government and think tanks have conducted numerous wargames and analyses of conflicts with Russia in the Baltics, China in the Taiwan Straits and South China Sea, Iran in the Middle East and North Korea on the Korean Peninsula. The results are generally bleak. Most conclude that war could lead to tens or hundreds of thousands of dead soldiers and civilians, domestic unrest, billions of dollars in economic damages, a global economic downturn and the potential collapse of long-held alliances. In addition, **these conflicts might escalate to nuclear war,** raising the number of dead to millions of civilians, **create far-reaching environmental destruction and trigger unthinkable global financial costs.** A U.S. war with China could reduce China’s gross domestic product (GDP) by between 25 and 35 percent and the American GDP by between 5 and 10 percent, according to a rand report. As the report concluded: A long and severe war could ravage China’s economy, stall its hard-earned development, and cause widespread hardship and dislocation. Such economic damage could in turn aggravate political turmoil and embolden separatists in China. Both the United States and China would also suffer huge numbers of military and civilian deaths and risk large-scale destruction of their military forces. If war expanded to include their allies, economic and casualty figures would skyrocket even further. Wargames that involve a conflict between NATO and Russia, including scenarios with Russian forces invading one or more Baltic countries, often escalate to include the threat—or use—of tactical nuclear weapons. Even a conventional war in the region could led to substantial destruction. **If one or both sides used nuclear weapons, the number of casualties would be virtually unthinkable. These costs and risks will likely give Washington, Moscow, Beijing, Tehran and even Pyongyang pause**. During the Cold War, Moscow and Washington confronted a similar bleak reality, which meant that most competition was irregular. THE COLD War offers a useful historical lens to assess the risks of conventional and nuclear war between major powers. NATO planners prepared for a possible Soviet and Warsaw Pact invasion of Western Europe. The United States and other NATO countries deployed forces close to the intra-German and Czech-German border to stop Warsaw Pact forces from conducting an armored blitzkrieg into West Germany. NATO also planned for nuclear war, limited or otherwise. The United States amassed a vast nuclear arsenal and adopted strategies like mutually assured destruction (MAD), which assumed that a full-scale use of nuclear weapons by two or more opposing sides would cause the annihilation of both the attacker and the defender. **The threat of such heavy costs deterred conflict**, despite some close calls. During the 1962 Cuban Missile Crisis, the United States and Soviet Union nearly went to war after a U.S. U-2 aircraft took pictures of Soviet medium-range and intermediate-range ballistic missiles (MRBMs and IRBMs) under construction in Cuba. But Washington and Moscow ultimately assessed that direct conflict was too costly. Deterrence held.

**1NC -- China**

**US private space industry is key to American soft power – it’s doing well now, but it’s tentative and the aff collapses it.**

**Cahan & Sadat ’20** [Bruce Cahan is co-founder and president of Urban Logic, Inc., a New York nonprofit qualified in California, an Ashoka Fellow social entrepreneur and a Stanford CodeX Fellow, Mir Sadat is a nonresident senior fellow in the Forward Defense practice of the Atlantic Council’s Scowcroft Center for Strategy and Security. He has more than twenty-five years of experience in private industry, higher education, and the US government. Sadat is an adjunct scholar with Modern War Institute at West Point and an adjunct professor at Georgetown University. Previously, he founded and served as the first editor-in-chief of Space Force Journal after completing his detail to the US National Security Council (NSC), where, as a policy director, he led interagency coordination on defense and space policy issues. In that role, he supported the establishment of both the US Space Force and US Space Command in recognition that space has also evolved into a warfighting domain similar to land, air, sea, and cyber. While on the NSC, Sadat also prioritized national security decisions involving US civil space and the commercial space sector. He led multiple efforts to reduce US risk and critical dependencies in US civil space and the commercial industrial base on foreign nations who view the United States as an adversary. Sadat pushed for innovative US policies to power space vehicles with modular nuclear reactors, secure the space supply chain, improve strategic messaging for space, establish norms and behavior in space, and to prevail in a new era of strategic technical competition. He is also a naval officer with intelligence and space qualifications. In his preceding two naval assignments, he served as a space policy strategist with the chief of naval operations in the Pentagon and as a space operations officer with the US Tenth Fleet/US Fleet Cyber Command. Sadat has also spent a considerable amount of time in various assignments within the US national security enterprise. In addition, he has previously deployed to overseas contingency operations in Afghanistan, where he served as a strategic advisor to two International Security Assistance Force commanding generals. Sadat has served as a cultural advisor to two Hollywood productions—The Kite Runner and Charlie Wilson’s War. He has a PhD from Claremont Graduate University and has taught at various universities in California and Washington, DC. He has trained and educated US and NATO troops on a variety of topics to increase their operational capability and strategic impact. Sadat has written extensively on US national security, space, Afghanistan, South Asia, and the broader Middle East, “US Space Policies for the New Space Age: Competing on the Final Economic Frontier”, 01-06-2021, [https://www.politico.com/f/?id=00000177-9349-d713-a777-d7cfce4b0000HYPERLINK "https://www.politico.com/f/?id=00000177-9349-d713-a777-d7cfce4b0000%5d//pranav"]//pranav](https://www.politico.com/f/?id=00000177-9349-d713-a777-d7cfce4b0000%5d//pranav)

**Space has been primarily a shared, not a warfighting, domain**.67 With each passing second of Planck time,68 **space enables a modern way of life, provides instantaneous global imagery, assures telecommunications, and captures humanity’s imagination for civil space exploration**. As a result, **space is a burgeoning marketplace and territory for commercial ventures and investors**. **Strengthening the US commercial space industrial base is vital to and beyond US national security. Civil space activities are a source of US “soft power” in** global commerce**, cooperation,** and investment. 69 **The civil space sector**, led by NASA, **is fundamental to America’s national security**. 70 NASA is on an ambitious critical path to return to the Moon by 2024,71 along with developing the capabilities and infrastructure for a sustained lunar presence. NASA’s lunar plans provide a lunar staging area for missions to Mars and beyond. They offer a strategic and economic presence for the United States on the Moon. **Congress, the White House, DoD, and NASA must recognize that economic and strategic dominance in service of national security requires catalyzing and accelerating growth of a vibrant, private US industrial and cultural expansion into the Solar System**. **Human visitation and eventual settlement beyond the Earth require sustaining visionary leaders, aided by, and aiding, US national security. A recurring theme in US policy is “maintaining and advancing United States dominance and strategic leadership in space” because US global competitors and adversaries are competent and capable of outpacing American space capabilities**. 72 **The stakes are high: At this historic moment, there is a real race for dominance over cislunar access and resources.**

**Specifically key to counter China rise**

**Cahan & Sadat ’20** [Bruce Cahan is co-founder and president of Urban Logic, Inc., a New York nonprofit qualified in California, an Ashoka Fellow social entrepreneur and a Stanford CodeX Fellow, Mir Sadat is a nonresident senior fellow in the Forward Defense practice of the Atlantic Council’s Scowcroft Center for Strategy and Security. He has more than twenty-five years of experience in private industry, higher education, and the US government. Sadat is an adjunct scholar with Modern War Institute at West Point and an adjunct professor at Georgetown University. Previously, he founded and served as the first editor-in-chief of Space Force Journal after completing his detail to the US National Security Council (NSC), where, as a policy director, he led interagency coordination on defense and space policy issues. In that role, he supported the establishment of both the US Space Force and US Space Command in recognition that space has also evolved into a warfighting domain similar to land, air, sea, and cyber. While on the NSC, Sadat also prioritized national security decisions involving US civil space and the commercial space sector. He led multiple efforts to reduce US risk and critical dependencies in US civil space and the commercial industrial base on foreign nations who view the United States as an adversary. Sadat pushed for innovative US policies to power space vehicles with modular nuclear reactors, secure the space supply chain, improve strategic messaging for space, establish norms and behavior in space, and to prevail in a new era of strategic technical competition. He is also a naval officer with intelligence and space qualifications. In his preceding two naval assignments, he served as a space policy strategist with the chief of naval operations in the Pentagon and as a space operations officer with the US Tenth Fleet/US Fleet Cyber Command. Sadat has also spent a considerable amount of time in various assignments within the US national security enterprise. In addition, he has previously deployed to overseas contingency operations in Afghanistan, where he served as a strategic advisor to two International Security Assistance Force commanding generals. Sadat has served as a cultural advisor to two Hollywood productions—The Kite Runner and Charlie Wilson’s War. He has a PhD from Claremont Graduate University and has taught at various universities in California and Washington, DC. He has trained and educated US and NATO troops on a variety of topics to increase their operational capability and strategic impact. Sadat has written extensively on US national security, space, Afghanistan, South Asia, and the broader Middle East, “US Space Policies for the New Space Age: Competing on the Final Economic Frontier”, 01-06-2021, [https://www.politico.com/f/?id=00000177-9349-d713-a777-d7cfce4b0000]//pranav](https://www.politico.com/f/?id=00000177-9349-d713-a777-d7cfce4b0000%5d//pranav)

**To compete with China, the United States cannot become China**. Instead, **the United States must play to its strengths to retain the global competitive advantage**. The **United States must utilize its soft power as global leader in financial and technological innovation,** proponent of vibrant true market economies and, most importantly, democratic norms and values. The United States must provide a level-playing field advantage to allies, partners, and other nations that view the United States as the 33 leading model of open, transparent economic and financial markets - which stand in contrast with the Chinese state-controlled opaque model.

**China was a late entrant to the space race. Its first satellite was sent into orbit in 1970,56 by which time the United States had already landed astronauts on the Moon**. In 2003, more than 40 years after the Russians and Americans embarked on the space race, China sent its first astronaut into orbit.57 In 2007, **China conducted a kinetic anti-satellite (ASAT) test on its dead weather satellite, which created a debris field of almost 3,400 fragments, more than half of which are expected to be in orbit in 2027**.58 Fast forward to 2018, when China conducted more space-oriented operations than any other country. In 2019, China became the first nation to send an unmanned rover to the moon's far side.59 In June 2020, China launched the BeiDou system, which is an alternative to global positioning system (GPS) space-based navigation and timing, to become the largest space-based position and timing system in the world – not only removing China’s dependence on US’ GPS but also serving as means to lure the rest of the world to adopt and provide data on its movements via BeiDou.60 In July 2020, China sent its first unmanned mission to orbit Mars before landing a rover on the surface, and is expected to reach the red planet in February 2021.61 In December 2020, China landed on the Moon, planted their flag, collected Moon rock samples, and returned to Earth.62 Chinese plans also include launching a permanent space station by 2022, and sending astronauts to the Moon by the 2030s.63 If successful, China would become only the second country, after the United States, to put a citizen on the Moon. **While the past twenty years of Chinese space accomplishments are impressively vast and rapid, their acquisition, data harvesting and exploitation of human knowledge and talent, product designs and manufacturing methods, prototypes and plans from US and allies’ companies, research facilities, universities and government operations has provided intellectual property, trade secrets and other assets that China did not discover or fund on its own.**

**Today, China’s commercial space sector is in its infancy but is set to grow with continued national and provincial support, which have been rapidly increasing over the past three years**.64 Since 2004, **the United States and China accounted for 74% of the $135.2 billion venture capital (VC) invested in commercial space**. 65 The early 2020s are pivotal, as it would be far cheaper for China and Chinese commercial space firms to acquire space technologies from the United States or allied nation companies seeking revenues or facing cashflow constraints, than to build the companies and their teams and technologies from scratch in China. **The tight coupling of Chinese military goals and an economy organized to achieve those goals magnifies the economic threats and market disruptions that the United States must immediately address, in order for DoD and national security operations to rely on US commercial space capabilities.**

**US leadership in this decade solves global war and results in a peaceful end to Chinese revisionism   
Erickson and Collins 10/21 [(Andrew, A professor of strategy in the U.S. Naval War College’s China Maritime Studies Institute)(Gabriel, Baker Botts fellow in energy and environmental regulatory affairs at Rice University’s Baker Institute for Public Policy) “A Dangerous Decade of Chinese Power Is Here,” Foreign Policy, 10/18/2021]**   
U.S. and allied policymakers are facing the most important foreign-policy challenge of the 21st century. **China’s power is peaking**; so is the political position of Chinese President Xi Jinping and the Chinese Communist Party’s (CCP) **domestic strength.** In the long term, China’s **likely decline** after this peak is a **good thing.** But right now, it creates a **decade of danger** from a system that increasingly realizes it only has a **short time** to fulfill some of its **most critical**, long-held **goals.**

Within the next five years, China’s leaders are likely to conclude that its deteriorating demographic profile, structural economic problems, and technological estrangement from global innovation centers are eroding its leverage to **annex Taiwan** and achieve other major strategic objectives. As Xi internalizes these challenges, his foreign policy is likely to become even more **accepting of risk**, feeding on his nearly decadelong track record of successful revisionist action against the rules-based order. Notable examples include China occupying and militarizing sub-tidal features in the **South China Sea**, ramping up air and maritime incursions against **Japan** and **Taiwan**, pushing border challenges against **India**, occupying **Bhutanese** and **Tibetan** lands, perpetrating **crimes against humanity** in [Xinjiang](https://www.nytimes.com/interactive/2019/11/16/world/asia/china-xinjiang-documents.html), and coercively enveloping **Hong Kong.**

The relatively low-hanging fruit is plucked, but **Beijing is emboldened to grasp the biggest single revisionist prize: Taiwan.**

Beijing’s actions over the last decade have triggered backlash, such as with the so-called AUKUS deal, but **concrete constraints** on China’s strategic freedom of action may not fully manifest until **after 2030.** It’s remarkable and dangerous that China has paid few costs for its actions over the last 10 years, even as its military capacities have rapidly grown.

**Beijing will likely conclude** that under current diplomatic, economic, and force postures for both **“gray zone”** and **high-end** scenarios, the 2021 to late 20**20s timeframe still favors China**—and is attractive for its 68-year-old leader, who seeks a historical achievement at the zenith of his career.

U.S. planners must mobilize resources, effort, and risk acceptance to maximize power and thereby deter Chinese aggression in the coming decade—**literally starting now**—and innovatively employ assets that currently exist or can be operationally assembled and scaled within the next several years. That will be the first step to pushing back against China during the 2020s—a decade of danger—before what will likely be a **waning of Chinese power.**

As Beijing aggressively seeks to undermine the international order and promotes a narrative of inevitable Chinese strategic domination in Asia and beyond, it creates a dangerous contradiction between its goals and its medium-term capacity to achieve them. China is, in fact, likely nearing the **apogee of its relative power**; and by 2030 to 2035, it will cross a **tipping point** from which it may **never recover** strategically. Growing headwinds constraining Chinese growth, while not publicly acknowledged by Beijing, help explain Xi’s high and apparently **increasing risk tolerance.** Beijing’s window of strategic opportunity is sliding shut.

China’s **skyrocketing household debt** levels exemplify structural economic constraints that are emerging much earlier than they did for the United States when it had similar per capita GDP and income levels. Debt is often a wet blanket on consumption growth. A 2017 analysis published by the Bank for International Settlements found that once the household debt-to-GDP ratio in a sample of 54 countries exceeded 60 percent, “the negative long-run effects on consumption tend to intensify.” China’s household debt-to-GDP ratio surpassed that empirical danger threshold in late 2020. Rising debt service burdens thus threaten Chinese consumers’ capacity to sustain the domestic consumption-focused “dual circulation” economic model that Xi and his advisors seek to build. China’s growth record during the past 30 years has been remarkable, but past exceptionalism does not confer future immunity from fundamental demographic and economic headwinds.

As debt levels continue to rise at an absolute level that has accelerated almost continuously for the past decade, China also faces a **hollowing out of its working-age population.** This critical segment peaked in 2010 and has since declined, with the rate from 2015 to 2020 nearing 0.6 percent annually—nearly twice the respective pace in the United States. While the United States faces demographic challenges of its own, the disparity between the respective paces of decline highlights its relative advantage compared to its chief geopolitical competitor. Moreover, the United States can choose to access a global demographic and talent dividend via immigration in a way China simply will not be able to do.

Atop surging debt and worsening demographics, **China also faces resource insecurity.** China’s dependence on imported food and energy has grown steadily over the past two decades. Projections from Tsinghua University make a compelling case that China’s oil and gas imports will peak between 2030 and 2035. As China grapples with power shortages, Beijing has been reminded that supply shortfalls equal to even a few percentage points of total demand can have outsized negative impacts.

Domestic resource insufficiency by itself does not hinder economic growth—as the Four Asian Tigers’ multi-decade boom attests. But China is in a different position. Japan and South Korea never had to worry about the U.S. Navy interdicting inbound tankers or grain ships. In fact, the United States was avowedly willing to use military force to protect energy flows from the Persian Gulf region to its allies. Now, as an increasingly energy-secure United States pivots away from the Middle East toward the Indo-Pacific, there is a substantial probability that energy shipping route protection could be viewed in much more differentiated terms—with oil and liquefied natural gas cargoes sailing under the Chinese flag viewed very differently than cargoes headed to buyers in other regional countries.

Each of these dynamics—demographic downshifts, rising debts, resource supply insecurity—either imminently threatens or is already actively interfering with the CCP’s long-cherished goal of achieving a “moderately prosperous society.” Electricity blackouts, real estate sector travails (like those of Evergrande) that show just how many Chinese investors’ financial eggs now sit in an unstable $52 trillion basket, and a solidifying alignment of countries abroad concerned by aggressive Chinese behavior all **raise questions about Xi’s ability to deliver.** With this confluence of adverse events only a year before the next party congress, where personal ambition and survival imperatives will almost drive him to seek anointment as the only Chinese “leader for life” aside from former leader Mao Zedong, the timing only fuels his sense of insecurity. Xi’s anti-corruption campaigns and ruthless removal of potential rivals and their supporters solidified his power but likely also created a quiet corps of opponents who may prove willing to move against him if events create the perception he’s lost the “mandate of heaven.” Accordingly, the baseline assumption should be that Xi’s crown sits heavy and the insecurity induced is thereby intense enough to drive **high-stake**, high-consequence posturing and action.

While Xi is under pressure to act, the external risks are magnified because so far, he has suffered few consequences from taking actions on issues his predecessors would likely never have gambled on. Reactions to party predations in Xinjiang and [Hong Kong](https://home.treasury.gov/policy-issues/financial-sanctions/recent-actions/20210716_33) have been restricted to diplomatic-signaling pinpricks, such as sanctioning responsible Chinese officials and entities, most of whom lack substantial economic ties to the United States. Whether U.S. restraint results from a fear of losing market access or a belief that China’s goals are ultimately limited is not clear at this time.

While the CCP issues retaliatory sanctions against U.S. officials and proclaims a triumphant outcome to its hostage diplomacy, these tactical public actions mask a growing private awareness that China’s latitude for irredentist action is poised to shrink. Not knowing exactly when domestic and external constraints will come to bite—but knowing that when Beijing sees the tipping point in its rearview mirror, major rivals will recognize it too—**amplifies Xi and the party’s anxiety to act on a shorter timeline.** Hence the dramatic acceleration of the last few years.

Just as China is mustering its own strategic actions, so the United States must also intensify its focus and deployment of resources. The United States has taken too long to warm up and confront the central challenge, but it retains **formidable advantages**, agility, and the ability to prevail—**provided it goes all-in now.** Conversely, if Washington fails to marshal its forces promptly, its achievements after 2030 or 2035 will matter little. Seizing the 2020s would enable Beijing to ~~cripple~~ [destroy] the free and open **rules-based order** and entrench its position by economically **subjugating regional neighbors** (including key U.S. treaty allies) **to a degree that could offset the strategic headwinds** China now increasingly grapples with.

Deterrence is never certain. But it **offers the highest probability** of avoiding the certainty that an Indo-Pacific region dominated by a CCP-led China would doom treaty allies, threaten the U.S. homeland, and likely set the stage for worse to come. Accordingly, U.S. planners should immediately mobilize resources and effort as well as accept greater risks to deter Chinese action over the critical next decade.

The greatest threat is armed conflict over Taiwan, where U.S. and allied success or failure will be fundamental and reverberate for the remainder of the century. There is a high chance of a major move against Taiwan by the late 2020s—following an extraordinary ramp-up in People’s Liberation Army capabilities and before Xi or the party state’s power grasp has ebbed or Washington and its allies have fully regrouped and rallied to the challenge.

So how should policymakers assess the potential risk of Chinese action against Taiwan reaching dangerous levels by 2027 or possibly even earlier—as emphasized in the testimonies of Adms. Philip Davidson and John Aquilino? In June, Chairman of the Joint Chiefs Gen. Mark Milley testified to the House of Representatives that Xi had “challenged the People’s Liberation Army to accelerate their modernization programs to develop capabilities to seize Taiwan and move it from 2035 to 2027,” although China does not currently have the capabilities or intentions to conduct an all-out invasion of mainland Taiwan.

U.S. military leaders’ assessments are informed by some of the world’s most extensive and sophisticated internal information. But what’s striking is open-source information available to everyone suggests similar things. Moving forward, a number of open-source indicators offer valuable “early warning lights” that can help policymakers more accurately calibrate both potential timetables and risk readings as the riskiest period of relations—from 2027 onward—approaches.

Semiconductors supply self-sufficiency. Taiwan is the “OPEC+” of semiconductors, accounting for approximately two-thirds of global chip foundry capacity. A kinetic crisis would almost certainly disrupt—and potentially even completely curtail—semiconductor supplies. China presently spends even more each year on semiconductor imports (around $380 billion) than it does on [oil](http://english.customs.gov.cn/Statics/0aba4bfd-f8ed-477c-9d16-dc3def897b7b.html), but much of the final products are destined for markets abroad. Taiwan is producing cutting-edge 5-nanometer and 7-nanometer chips, but China produces around 80 percent of the rest of the chips in the world. The closer China comes to being able to secure “good enough” chips for “inside China-only” needs, the less of a constraint this becomes.

Crude oil, grain, strategic metals stockpiles—the commercial community (Planet Labs, Ursa Space Systems, etc.) has developed substantial expertise in cost-effectively tracking inventory changes for key input commodities needed to prepare for war.

Electric vehicle fleet size—the amount of oil demand displaced by electric vehicles varies depending on miles driven, but the more of China’s car fleet that can be connected to the grid (and thus powered by blockade-resistant coal), the less political burden Beijing will face if it has to weather a maritime oil blockade imposed in response to actions it took against Taiwan or other major revisionist adventures. China’s passenger vehicle fleet, now approximately 225 million units strong, counts nearly 6.5 million electric vehicles among its ranks, the lion’s share of which are full-battery electrics. China’s State Council seeks to have 20 percent of new vehicles sold in China be electric vehicles by 2025. This target has already basically been achieved over the last few months, meaning at least 3.5 to 4 million (and eventually many more) new elective vehicles will enter China’s car fleet each year from now on.

Local concentration of maritime vessels—snap exercises with warships, circumnavigations, and midline tests with swarms of aircraft highlight the growing scale of China’s threat to [Taiwan](https://www.andrewerickson.com/2021/06/quick-look-cmsis-4-6-may-2021-conference-large-scale-amphibious-warfare-in-chinese-military-strategy-taiwan-strait-campaign-focus/). But these assets alone cannot invade the island. To capture and garrison, Beijing would need not only air, missile, naval, and special operations forces but also the ability to move lots of equipment and—at the very least—tens of thousands of personnel across the Taiwan Strait. As such, Beijing would have to amass maritime transport assets. And given the scale required, this would alter ship patterns elsewhere along China’s coast in ways detectable with artificial intelligence-facilitated imagery analysis from firms like Planet Labs (or national assets).

Only the most formidable, agile American and allied deterrence can kick the can down the road long enough for China’s slowdown to shut the window of vulnerability. **Holding the line** is likely to require frequent and sustained proactive enforcement actions to disincentivize full-frontal Chinese assaults on the rules-based order in the Indo-Pacific. Chinese probing behavior and provocations must be met with a range of symmetric and asymmetric responses that impose real costs, such as publishing assets owned by Chinese officials abroad, cyber interference with China’s technological social control apparatus, “hands on” U.S. Navy and Coast Guard enforcement measures against Maritime Militia-affiliated vessels in the South China Sea, intensified air and maritime surveillance of Chinese naval bases, and visas and resettlement options to Hong Kongers, Uyghurs, and other threatened Chinese citizens—including CCP officials (and their families) who seek to defect and/or leave China. U.S. policymakers must make crystal clear to their Chinese counterparts that the engagement-above-all policies that dominated much of the past 25 years are over and the risks and costs of ongoing—and future—adventurism will fall heaviest on China.

Bombastic Chinese reactions to emerging cohesive actions verify the approach’s effectiveness and potential for halting—and perhaps even reversing—the revisionist tide China has unleashed across the Asian region. Consider the recent nuclear submarine deal among Australia, the United States, and the United Kingdom. Beijing’s strong public reaction (including toleration of [nuclear threats](https://www.globaltimes.cn/page/202109/1234460.shtml) made by the state-affiliated *Global Times*) highlights the gap between its global information war touting China’s irresistible power and deeply insecure internal self-perception. Eight nuclear submarines will ultimately represent formidable military capacity, but for a bona fide superpower that believes in its own capabilities, they would not be a game-changer. Consider the U.S.-NATO reaction to the Soviet Union’s commissioning of eight Oscar I/II-class cruise missile subs during the late Cold War. These formidable boats each carried 24 SS-N-19 Granit missiles specifically designed to kill U.S. carrier battle groups, yet NATO never stooped to public threats.

With diplomatic proofs of concepts like the so-called AUKUS deal, the Quadrilateral Security Dialogue, and hard security actions like the Pacific Deterrence Initiative now falling into place, it is time to comprehensively peak the non-authoritarian world’s protective action to hold the line in the Indo-Pacific. During this decade, U.S. policymakers must understand that under Xi’s strongman rule, personal political survival will dictate Chinese behavior. Xi’s recreation of a “one-man” system is a one-way, high-leverage bet that decisions he drives will succeed.

If Xi miscalculates, a significant risk given his suppression of dissenting voices while China raises the stakes in its confrontation with the United States, the proverbial “leverage” that would have left him with outsized returns on a successful bet would instead amplify the downside, all of which he personally and exclusively signed for. Resulting tensions could very realistically undermine his status and authority, embolden internal challengers, and weaken the party. They could also foreseeably drive him to double down on mistakes, especially if those led to—or were made in the course of—a kinetic conflict. Personal survival measures could thus rapidly transmute into regional or even **global threats.**

If Xi triggered a “margin call” on his personal political account through a failed high-stakes gamble, it would likely be paid in blood. Washington must thus prepare the U.S. electorate and its institutional and physical infrastructure as well as that of allies and partners abroad for the likelihood that tensions will periodically ratchet up to uncomfortable levels—and that actual conflict is a concrete possibility. Si vis pacem, para bellum (“if you want peace, prepare for war”) must unfortunately serve as a central organizing principle for a variety of U.S. and allied decisions during the next decade with China.

Given these unforgiving dynamics and stakes, implications for U.S. planners are stark: Do whatever remains possible to “peak” for deterrent competition against China by the mid-to-late 2020s, and accept whatever trade-offs are available for doing so.

Nothing we might theoretically achieve in 2035 and beyond is worth pursuing at the expense of China-credible capabilities we can realistically achieve no later than the mid-to-late 2020s.