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### 1NC --- OFF

#### Innovation high now but aff trades off

Raghavan 21[Seetha Raghavan, Seetha Raghavan is a professor in UCF’s Department of Mechanical and Aerospace Engineering. 8-4-2021, "The Impact of Innovation in the New Era of Space Exploration," University of Central Florida News | UCF Today, https://www.ucf.edu/news/the-impact-of-innovation-in-the-new-era-of-space-exploration/]/ISEE

Every once in a while, a confluence of discoveries, events and initiatives results in a breakthrough so significant that it propels the entire world to a higher level, redefining what is possible in so many different fields. This breakthrough is taking centerstage now, as the new era of space exploration — catalyzed by increasing launch access — dawns upon us. The surge of innovation that comes with this will create new opportunities and inspire the next generation of doers. When this happens, boundaries between scientific and social impact are blurred. Innovation leading to scientific discovery can benefit society in the same way that social innovation can diversify and support scientific innovators, who can contribute to global progress. To ride this wave of progress, we must all participate and innovate in the new era of space exploration. The intersection of space exploration, innovation and impact isn’t a new phenomenon. In the past, technology developments and spin-offs from space research have consistently found their way into communities worldwide sometimes with lifesaving benefits. The International Space Station supports experiments that have led to discoveries and inventions in communication, water purification, and remote guidance for health procedures and robotic surgeries. Satellite-enabled Earth observation capabilities that monitor natural disasters, climate and crops often support early warnings for threats and mitigation strategies. Space exploration has always been relevant to everyone no matter the discipline or interest. Commercialization of space has been key in many ways to the current boost in “firsts” over the last few years. It has spurred innovation in launch vehicles and related technologies that led to firsts in vertical-takeoff-vertical landing rocket technology, reusability of rocket boosters and privately developed crewed missions to orbit. Concurrently, NASA has continued to captivate our imagination with the first flight of a helicopter in another world, a mission to return an asteroid sample to Earth and sending a probe to make the closest ever approach to the sun. While we celebrate the scientific progress, there is a vastly important question that we all need to focus on: How can we drive the surge in innovation offered by increased access to space, to benefit humankind? Access to low-Earth orbit, and eventually human exploration of space, is a portal to achieve many impactful outcomes. The numbers and completion rate of microgravity experiments conducted by scientists will be greatly increased as a range of offerings in suborbital flights provide more opportunities to advance critical research in health, agriculture, energy, and more. Lunar, planetary, and even asteroid exploration may lead to discoveries of new materials — busting the limitations now imposed on capabilities for energy, transportation, and infrastructure or creating new sensors and devices that enhance safety on Earth. Space tourism —one can hope — has the power to potentially create an awareness of our oneness that may lead to social change.

#### Chinese space development is key to long term innovation

Neel V. Patel 1-21-2021, "China’s surging private space industry is out to challenge the US," MIT Technology Review, https://www.technologyreview.com/2021/01/21/1016513/china-private-commercial-space-industry-dominance/

At first glance, the Ceres-1 launch might seem unremarkable. Ceres-1, however, wasn’t built and launched by China’s national program. It was a commercial rocket—only the second from a Chinese company ever to go into space. And the launch happened less than three years after the company was founded. The achievement is a milestone for China’s fledgling—but rapidly growing—private space industry, an increasingly critical part of the country’s quest to dethrone the US as the world’s preeminent space power. Related Story Lunik: Inside the CIA's audacious plot to steal a Soviet satellite How a team of spies in Mexico got their hands on Russia's space secrets—and tried to change the course of the Cold War. The rivalry between the US and China, whose space program has surged over the last two decades, is what most people mean when they refer to the 21st-century's space race. China is set to build a new space station later this year and will likely attempt to send its taikonauts to the moon before the decade ends. But these big-picture projects represent just one aspect of the country’s space ambitions. Increasingly, the focus is now on the commercial space industry as well. The nation's growing private space business is less focused on bringing prestige and glory to the nation and more concerned with reducing the cost of spaceflight, increasing its international influence—and making money. “The state is really great at large, ambitious projects like going to the moon or developing a large reconnaissance satellite,” says Lincoln Hines, a Cornell University researcher who focuses on Chinese foreign policy. “But it’s not responsive to meeting market needs”—one big way to encourage rapid technological growth and innovation. “I think the government thinks its commercial space sector can be complementary to the state,” he says. What are the market needs that Hines is referring to? Satellites, and rockets that can launch them into orbit. The space industry is undergoing a renaissance thanks to two big trends spurred by the commercial industry: we can make satellites for less money by making them smaller and using off-the-shelf hardware; and we can also make rockets for less money, by using less costly materials or reusing boosters after they’ve already flown (which SpaceX pioneered with its Falcon 9). These trends mean it is now cheaper to send stuff into space, and the services and data that satellites can offer have come down in price accordingly. China has seen an opportunity. A 2017 report by Bank of America Merrill Lynch estimates that the space industry could be worth up to $2.7 trillion by 2030. Setting foot on the moon and establishing a lunar colony might be a statement of national power, but securing a share of such a highly lucrative business is perhaps even more important to the country’s future. “In the future, there will be tens of thousands of satellites waiting to launch, which is a major opportunity for Galactic Energy” says Wu Yue, a company spokesperson. The problem is, China has to make up decades’ worth of ground lost to the West. How did China get here—and why? Until recently, China’s space activity has been overwhelmingly dominated by two state-owned enterprises: the China Aerospace Science & Industry Corporation Limited (CASIC) and the China Aerospace Science and Technology Corporation (CASC). A few private space firms have been allowed to operate in the country for a while: for example, there’s the China Great Wall Industry Corporation Limited (in reality a subsidiary of CASC), which has provided commercial launches since it was established in 1980. But for the most part, China’s commercial space industry has been nonexistent. Satellites were expensive to build and launch, and they were too heavy and large for anything but the biggest rockets to actually deliver to orbit. The costs involved were too much for anything but national budgets to handle. That all changed this past decade as the costs of making satellites and launching rockets plunged. In 2014, a year after Xi Jinping took over as the new leader of China, the Chinese government decided to treat civil space development as a key area of innovation, as it had already begun doing with AI and solar power. It issued a policy directive called Document 60 that year to enable large private investment in companies interested in participating in the space industry.

#### Commercial space innovation stops extinction

Charles Beames 18, Chairman of the SmallSat Alliance, Executive Chairman of York Space Systems, former Principal Director of Space and Intelligence in the Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics (OUSD(AT&L)), Col. (ret.) in the USAF where he served 23 years in space & intelligence leadership positions around the world, 8/8/18, “Op-ed | SmallSat Alliance is on a path toward a new space horizon,” <https://spacenews.com/op-ed-smallsat-alliance-is-on-a-path-toward-a-new-space-horizon/>

We find ourselves still at the dawn of a new space century, mindful of the victories and setbacks of our past, eager to pass the torch to the next generation of space visionaries, scientists, engineers, and enthusiasts. We look to the future not just to see how much bigger, faster, or higher we can reach, but also how the United States, and specifically the U.S. space community, can again inspire the nations of the world to align with us, as it did in the 20th century. The SmallSat Alliance is an alliance of companies developing, producing, and operating in all segments of the ‘next generation’ space economy; championing renewed U.S. leadership in the burgeoning commercial space economy, and advocating for the transformation of government-led space capabilities. We are experienced space professionals who have chosen to join with others leveraging our decades of hard-won experience, to develop smarter ways to explore space in the 21st century. A wonderful outgrowth of the legacy space program is the commercial, entrepreneurial, and job-creating commercial space business that it bequeathed. These next-generation enterprises range from multi-million-dollar startups providing rideshare opportunities or components for small satellites to multi-billion-dollar space data-analytic platforms reinventing urban car service and agricultural production. The early returns of this economic revolution are already on our doorstep: space data capabilities are exponentially growing elements of the 21st century world economy. Beginning with the dreams and funding by successful tech entrepreneurs, enormous venture investments are already delivering wondrous benefits to the world. Commercial Space – Profit and Non-Profit There are really two major categories in the commercial sector, the profit driven and the non-profit. The classic for-profit companies include not only those designing, building, launching, and operating satellites but also the tech sector that is turning that raw space data into gold through machine-learning analytics. Since for-profit companies are no longer dependent upon the revenues generated by the Cold War space race culture of a bygone era, this new generation of space companies is able to more efficiently capitalize on Moore’s Law, the nonstop exponential growth in chip density, and the associated networking technology co-evolving with it. This new generation is building profitable businesses helping to clean up our oceans of garbage and debris with satellite surveillance, reconnoitering to assist in enforcing laws that protect our oceans from illegal, unregulated, unlicensed fishing, something that is rapidly depleting the world’s most valuable and essential lifeforms. It’s leading in the innovative use of low-cost satellite constellations to produce ubiquitous remote-sensing data, enabling small business owners to be more profitable and less wasteful. For example, precise timing signals from space are already optimizing transportation of people, goods, and services, with even further gains anticipated with the introduction of artificial intelligence to assist drivers, perhaps even someday replacing them entirely. The non-profit sector is the other side of commercial space, concerned more for the general welfare of society, but every bit as integral to this new space enterprise. Much like every century before it in human history, ours is not without its unique challenges, some of which have been a consequence of the last, and all of which the space data domain can be leveraged to help solve. Examples are endless, but one challenge that this new space community is uniquely well-adapted for is to further inform worldwide resource allocation for the 21st century and beyond. These two primary resources are sustainable water and the materials needed for adequate housing for an ever-increasing human population. As cities and urbanization continue to expand, governmental planning challenges such as transportation design optimization for goods and services are only the beginning. Additionally, through using inexpensive remote sensing technologies, some members are designing space data analytics to mitigate human suffering from plagues, contain outbreaks, and combating illegal poaching. Some are connecting with other non-profits to curtail human trafficking for the sex trade or forced labor for migrant debt repayment. Still others are helping non-governmental organizations in their work to expose the use of children as soldiers. Addressing these challenges has little to do with resuscitating dreams conceived by long deceased science-fiction writers and much more to do with turning “swords back into plowshares” to solve real threats to humanity. Other non-profit initiatives include pursuing an even more foundational understanding of who we are and how to be the best custodians of our environment. Much as exploring and monitoring the world’s oceans has advanced civilization through a better understanding of human life and the planet, so too does exploring and monitoring from space. Low Earth orbit (LEO) provides a unique vantage point to look back on the planet and understand what is happening, anticipate what might happen and prepare for the future. In addition to better understanding Earth, responsible and rapid exploitation of the low Earth orbit domain will enhance the understanding of the solar system and the rest of the universe. Small satellites already offer low-cost platforms to study and explore what lies beyond the Earth. Other members are pioneering the use of zero-carbon, hydrogen-based reusable propulsion systems to ensure we don’t worsen our atmosphere using kerosene-fueled rockets for the coming tsunami of satellite launches. Finally, a mission ensuring the general welfare and planet survival for the next thousand years is finally confronting the existential threat that asteroids and comets pose to humanity. These extra-terrestrial, deep-space threats are passing dangerously close to our planet, and today we have no solar map of them and no defense.

Noting the recent successful landing of the Tianwen-1 Mars rover Zhurong, Wang stated that China has bigger plans, beyond even a Mars sample return mission planned to launch in early 2029.

#### China in space key to long term colonization

Andrew Jones, 3-18-2021, "China wants to build a sustainable human presence on Mars. Here's how.," Space, https://www.space.com/china-plans-mars-base-with-astronauts/ISEE

These and other, unspecified robotic missions to Mars, including in-situ resource utilization tests — for example extracting subsurface water from beneath the surface or generating oxygen — are intended to build a platform for initial human missions, starting with an orbital outpost, then landing on the planet's surface and finally constructing a Mars base. The third and final stage envisions forming a so-called "econosphere," facilitated by a large-scale Earth-to-Mars fleet, large-scale development and utilization of resources. Wang revealed that CALT, which belongs to China's main space contractor, the China Aerospace Science and Technology Corporation (CASC), has completed comprehensive research on mission architecture. This includes looking at the available launch times, the types of orbits the spacecraft can use to get to Mars and the propulsion system best suited to allow short- and long-term stays and regular, repeated visits. China's Mars rover Zhurong poses for a self portrait with its lander in this photo from Utopia Planitia released on June 11, 2021. China's Mars rover Zhurong poses for a self portrait with its lander in this photo from Utopia Planitia released on June 11, 2021. (Image credit: CNSA) The initial robotic phase of China's exploration plans would rely on chemical rockets, the propulsion used today for launches. Early human missions would use a number of heavy-lift launchers to construct the Mars spacecraft in orbit, Wang said. These would then rendezvous and dock with a ferry stage using nuclear electric and nuclear thermal propulsion for Earth-Mars transfer. Cargo would fly to and land on Mars separately, and a Mars descent and ascent vehicle (MDAV) would transfer astronauts to and from the surface, he added. Nuclear technologies would allow a large decrease in the size of the Earth-Mars transfer vehicles. This method of propulsion has been discussed and researched for decades but still requires a number of technological breakthroughs and its prospective use have typically been met with environmental concerns. Nuclear fusion propulsion and space elevator technology were also considered but require both theoretical and technological breakthroughs. The econosphere phase envisions developing reusable fleets of spacecraft, propellant depots for refueling spacecraft in Mars orbit, and the use of cycle orbits, a concept previously put forward by Buzz Aldrin. The plan presented by Wang is both ambitious but also at a very early stage. CALT makes many of China's Long March rockets and deals only with the ideas for propulsion. China's Shenzhou-12 spacecraft and its Long March 2F rocket roll out to the launch pad on June 9, 2021. China's Shenzhou-12 spacecraft and its Long March 2F rocket roll out to the launch pad on June 9, 2021. (Image credit: CASC) Advertisement Wang delivered his pre-recorded talk as CALT is preparing for the launch of the Shenzhou 12 mission, which is scheduled to launch three astronauts to China's new Tianhe space station today (June 16) at 9:22 p.m. EDT (0122 June 17 GMT; 9:22 a.m. June 17 local time in Beijing).

#### That’s key to getting off the rock

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Why Mining? **Technological innovation**—primarily brought about by **commercial players** such as Elon Musk[2] and Jeff Bezos[3]—is **changing the landscape** of space exploration. **Leading the way** in this new-era race are the **startups** including Planetary Resources, Deep Space Industries, Ispace, and Kleos Space.[vii] Research into the feasibility of human and robotic missions to asteroids is being conducted by both governmental organisations, like NASA and JAXA (Japan Aerospace Exploration Agency), as well as private companies such as Planetary Resources.[viii] However, for realising affordable space travel and space industrialisation, it is **essential** to find **extraterrestrial materials** such as metals, minerals and water that do not have to be transported from Earth. Thus, the first objective in carrying out asteroid mining activity is to obtain elements that are critical for basic sustenance on Earth. It has been identified that the asteroid belt in our solar system contains eight-percent metal-rich (M type) asteroids and 75-percent volatile-rich carbonaceous (C type) asteroids.[ix] The second incentive for celestial mining companies is to haul precious minerals and cargo raw materials to Earth to fuel its fast depleting resources. This would significantly increase the mining company’s valuation and greatly impact the global economy. According to a 2012 Reuters interview with Planetary Resources, a 30-meter-long (98-foot) asteroid can hold platinum worth somewhere from US$25 billion to US $50 billion.[x] These metals are highly useful and valuable, both on Earth and in space.[xi] Third, asteroids give humans the potential to create tools in space, since iron, nickel and cobalt are in abundance.[xii] Chris Lewicki, Planetary Resources CEO, has said, “Using 3D printing technology one can grab material off asteroids and 3D print something that never has to be on a rocket. Tools, machines and even habitats can then be built off Earth, reducing the cost of exploration even further.[xiii] Fourth, resource extraction is also becoming a focus for many Middle Eastern nations.[xiv] The Middle Eastern oil states, such as Saudi Arabia and the United Arab Emirates are investing heavily in this industry as they are looking at space as a way to diversify out of the earthly benefits of fossil fuel.[xv] Fifth, countries such as India and China are looking to mine the Moon for extracting Helium-3, which is considered a clean and efficient form of energy. It is thought that this isotope could provide safer nuclear energy in a fusion reactor, since it is not radioactive and would not produce dangerous waste products.[xvi] Finally, the water available in outer space could be used to make rocket propellants. According to scientists, since water is abundant in outer space, in some or the other form, it could be extracted and electrolysed to derive hydrogen and oxygen, the key ingredients of rocket fuel.[xvii] Thus, instead of carrying one’s own fuel all the way, asteroids could serve as extraterrestrial/orbital “gas stations” for fuelling future deep space missions. This would simultaneously make space travel more cost-effective and productive. Such ventures are also seen to be intrinsic to further science and discovery, in addition to revolutionising commercial development in outer space. The mining of asteroids could also provide a near-infinite supply of the precious resources for Earth to use. [xviii]

#### Extinction’s inevitable – only growth can sustain colonization and solve.

**Skran 16** [Dale Skran is Executive Vice President of the National Space Society and a member of the Board of Directors of the Alliance for Space Development. “Settling space is the only sustainable reason for humans to be in space,” <http://www.thespacereview.com/article/2915/1>]

As robotic and artificial intelligence technologies improve and enable increasingly robust exploration without a human presence, eventually there will be only one sustainable reason for humans to be in space: settlement. Research into the recycling technology required for long-term off-Earth settlements will directly benefit terrestrial sustainability. Actively working toward developing and settling space will make available mineral and energy resources for use on Earth on a vast scale. Finally, space settlement offers the hope of long-term species survival that remaining on Earth does not. There are more than seven billion people on the Earth today. No rational space settlement advocate suggests that any significant portion of that population, or even of those who are rich, will be moving to Mars or anywhere else in space. However, a recent essay by Astro Teller, head of Google X Labs, and his wife Danielle, a physician and researcher takes the bold position that “It’s completely ridiculous to think that humans could live on Mars.” This essay, published by Quartz, repeats with little examination some of the hoariest arguments against space settlement. To support this view, the Tellers quote their 12-year-old daughter: “I can’t stand that people think we’re all going to live on Mars after we destroy our own planet.” This quote contains two mischaracterizations that demand refutation: that “we are all” going to live in space and that we are going to live in space after we destroy Earth. Another canard that has long floated about was given form by the recent film Elysium starring Matt Damon: the rich will leave the poor on the Earth and escape to space settlements. Upon examination, all three of these ideas are strawmen. There are more than seven billion people on the Earth today. No rational space settlement advocate suggests that any significant portion of that population, or even of those who are rich, will be moving to Mars or anywhere else in space. Instead, we expect that relatively small numbers of highly qualified individuals, or those who are deeply dedicated to living in space, would form the first settlements. Over a significant period of time, thousands more from the Earth would join those settlements as they become increasingly self-sufficient. Over more time, various possible niches for settlement (Moon, Mars, asteroids, free space, etc.) will be occupied, and eventually the population in space will total many millions, most of whom will have been born in space. So why then do Elon Musk, Stephen Hawking, and many others, including organizations like the National Space Society (NSS) and Alliance for Space Development, believe strongly that space settlement is essential to human survival? Although this may seem surprising, the Earth is not a “safe space.” The destiny of virtually all species on Earth is extinction in a relatively short span of geologic time. The Tellers claim that “we live on a planet that is perfect for us.” This statement is both completely true and total nonsense. We fit well on the Earth because we have evolved over millions of years to become creatures that are both adapted to live here and to like living here. It is truer to say that we are perfect for the Earth than the reverse. In fact, the Earth is not such a commodious place. It is subject to periodic calamities of various sorts, ranging from massive asteroid and comet impacts to titanic volcanic eruptions, and from periodic ice ages to disastrous solar flares. In the short run, the Earth seems balmy and comfortable. Viewed from the perspective of deep time, it starts to look more like a death trap, bedeviled by regular mass extinctions. However, things are actually quite a bit worse. Although there are many potentially bad things that might happen to the human race on the Earth from natural sources, there are many more from unnatural sources. We have been dancing with nuclear disaster for a long time. An apocalyptic atomic war is not inevitable, but it is possible. Add to this scenario the genetically engineered killer virus, “gray goo,” a robot revolt, and other horrors as yet undreamt, and the odds against human survival get longer. Hence, the need to abandon the fiction of Earth as our eternal and unchanging perfect home and to appreciate both the need for, and promise of, space settlement. Not so the rich can escape to an Elysium in the sky, or so we can all leave behind a polluted and overheated Earth, but simply so that the human species and human culture has a chance at surviving and flourishing in the long term. The Tellers believe that sustainability on the Earth has no relationship to what we do in space, but the same technologies that enable deep space settlement will have a profound impact on terrestrial sustainability. The Tellers write, “We haven’t even colonized the Sahara desert, the bottom of the oceans… because it makes no economic sense.” This may be true, but it also makes no sense to settle the Sahara desert, the bottom of the oceans, or Antarctica since these locations are on the Earth, and humans living there will not increase the probability of species survival. Near-Earth free space settlements and lunar bases are just stepping stones to ones much further out that are quarantined from Earth by millions of kilometers of vacuum. Once the motivation of species survival is put front and center, it becomes clear that a settlement in low Earth orbit, on the Moon, at L5, or on the Martian surface is not nearly sufficient. What is needed is a large set of thriving communities distributed throughout the solar system, and even ultimately in the Oort Cloud surrounding the solar system proper. This vision is not a small thing. It will be the work of many generations, just as was the settling of the New World or, even earlier in history, the human diaspora out of Africa along the Asian coast to Australia and beyond. The Tellers believe that sustainability on the Earth has no relationship to what we do in space, but the same technologies that enable deep space settlement will have a profound impact on terrestrial sustainability. Space settlements, of necessity, push the limits of food production per square meter and per liter of water. Space settlement agricultural methods can also be applied to growing food in parched California or in vertical farms in crowded urban areas. Space settlements require humans and technology to co-exist in close proximity. This implies an absolute minimization of pollution and sustained recycling of all waste. Such technologies seem highly applicable to sustainability on Earth as well. We will need to provide the best possible medical care for remote space settlements, which will be far from hospitals on Earth. The technologies that make such medicine effective—“tricorders”, telemedicine, and so on—can also bring medical care to underdeveloped and underserved areas of the Earth. The Tellers raise the specter of “winter-over syndrome” in the Antarctic, writing that “living on Mars would be way, way more miserable than living in Antarctica,” and concluding, “Nobody wants to live there.” Although it is clear that the Tellers will not be going, the large numbers who signed up for Mars One’s sketchy settlement plans suggest that a lot of people do want to live on Mars. There are real challenges to constructing space settlements, but current Antarctic bases are not true settlements. Nobody lives there with their families, with the exception of the coastal Esperanza Base, where about ten families routinely winter over. No real effort is made to create any kind of human environment that is comfortable over a long period of time. Conditions in Antarctica might be better compared to living in a campground than a self-sustaining settlement. Additionally, the current Antarctic Treaty essentially prevents any extraction or use of the natural resources found there, thus making economically independent settlements infeasible. The Tellers think that, from an economic perspective, “Mars has nothing to offer in return.” Here, at least in the short run, they have a point. Let us not shy from the truth. Conditions in the early settlements in the New World were difficult at best, and the casualty rate was high. We should expect the same to hold true for early space settlements. However, Jamestown and Plymouth gave rise to vast cities and a tamed landscape on a scale of hundreds of years. We now bring to the table technological means that would seem magical to the Jamestown settlers. Even as difficult an environment as the Moon can be developed and settled using technology that either exists currently or is an engineering project, as one book suggests. The Tellers think that, from an economic perspective, “Mars has nothing to offer in return.” Here, at least in the short run, they have a point. Although Mars may have more of the natural resources a settlement will need than, say, the Moon, it is at the bottom of a fairly steep gravity well and, for the time being, it is not likely that there will be many Mars-to-Earth exports. However, this is like looking at the resources of the New World via a keyhole, seeing a swamp, and reporting back that there is no point in going there. It is worth keeping in mind the example of “Seward’s Folly.” The purchase of Alaska from Russia was mocked as “Seward’s icebox” and a “polar bear garden.” At the time, the oil and mineral riches of Alaska were undiscovered and undreamt of. Space itself teems with valuable resources, including continuous and abundant solar energy and mineral wealth on a scale beyond imagination just in the near Earth asteroids. Just as the Tellers were dismissing space resources as irrelevant, the US Congress was laying the legal groundwork for asteroid and lunar mining with the passage of the Commercial Space Launch Competitiveness Act, signed by President Obama on November 23, 2015. The Tellers also seem unaware that their leadership at Google, Larry Page and Eric Schmidt, are investors in the asteroid mining firm Planetary Resources. The Tellers say that “we won’t survive [on Earth] unless we learn to live in a resource neutral way.” This statement assumes that that Earth is a closed system, which it is not. The Earth is flooded daily with vast amounts of solar energy that, if exploited, could power just about any civilization we wish to maintain. There is no technical limitation to providing continuous, carbon-free power from space solar power satellites beaming power back to the surface of the Earth anywhere it might be needed. The main opposition to this idea derives from an unwillingness to consider centralized power systems on ideological grounds, combined with the unexpected reality of very cheap natural gas today. Even the most conservative consideration of near-Earth asteroid resources suggests that there is no reason to view the Earth as a closed system to which nothing can be added. The time for the settlement of Mars will come, but first we need to build on our success in developing the resources of Earth orbit, in the form of navigation, Earth observation, communication, and weather satellites, by fully developing the economic potential of the Earth-Moon system. Space settlements must flow out of the development of the economic resources of space if they are to be sustainable in the long term. The NSS has developed a complete description of milestones toward the development of space settlements. In view of the above, Astro Teller was probably right to turn down the “space cadet” who wanted Google X to spend money on Mars settlement. But wait—Google is doing exactly that. A key first step toward space settlement is ensuring a gapless transition from the existing International Space Station to commercially owned and operated LEO space stations as described in the NSS position paper “Next Generation Space Stations.” Next will come the development of the resources of the Moon and neaby asteroids leading to the creation of a self-sustaining Earth-Moon economy. Once we have established an asteroid-Earth-Moon economy that makes the resources found in this region fully available for projects ranging from the construction of solar power satellites to fueling future Mars missions, trips to Mars will be far less of a reach than they are today. In view of the above, Astro Teller was probably right to turn down the “space cadet” who wanted Google X to spend money on Mars settlement. Currently Google’s money would be better spent in low Earth orbit, among the asteroids, and on the Moon, joining forces with the growing number of entrepreneurs seeking their fortunes in space. But wait—Google is doing exactly that by sponsoring the Google Lunar X PRIZE to encourage private groups to send landers to the Moon, and investing $900 million in Elon Musk’s SpaceX. Given that corporate Google (now Alphabet) has just made a massive investment in a company founded to settle Mars, the Tellers’ essay sounds a bit like sour grapes. In any case, the Tellers are completely wrong in their disregard of the potential economic benefits of space development and the underlying motivation for space settlement.

### 1NC --- OFF

#### China should

#### ----create and comply with a global NFU policy on nuclear weapons in which no nuclear weapon will ever be launched

#### ----sever its alliance with Russia permanently

#### ----commit to not building mining base in space

#### ----not mine asteroids in space

#### Global NFU solves escalation.

Global Zero, No Date, [Since its launch in Paris in December 2008, Global Zero has grown to include 300 world leaders and half a million citizens worldwide"No First Use FAQs," https://www.globalzero.org/no-first-use-faqs/]/ISEE

What does No-First-Use (NFU) actually mean? “No First Use” is a commitment to never use nuclear weapons first under any circumstances, whether as a preemptive attack or first strike, or in response to non-nuclear attack of any kind. Where do nuclear-armed countries stand on No First Use? China is the only nuclear-armed country to have an unconditional NFU policy. India maintains a policy of NFU with exceptions for a response to chemical or biological attacks. France, North Korea, Pakistan, Russia, the United Kingdom and the United States maintain policies that permit the first use of nuclear weapons in a conflict. Israel does not acknowledge the existence of its nuclear arsenal so has no publicly known position. Why advocate for global NFU commitments now? The world has never faced so many crises that could escalate to nuclear conflict. In addition to the precarious situation on the Korean peninsula, we’re running acceptably high risks of nuclear weapons use between NATO and Russia, India and Pakistan, and the United States and China. In fact right now the chances that nuclear weapons will be used — intentionally, accidentally, or due to miscalculation — are the highest they’ve been since the worst days of the Cold War. Establishing global NFU commitments would immediately make the world safer by resolving uncertainty about what a nuclear-armed country might do in a crisis, which removes pressure and incentive for any one country to “go nuclear” first in a crisis. What are consequences of nuclear first use? Any use of a nuclear weapon would invite massive retaliation. A recent study by Global Zero estimated U. S. fatalities due to a Russian retaliation to a U.S. nuclear first strike. It found 30% of the total population of the top 145 biggest cities in the United States — 21 million Americans — would die in a Russian nuclear counterattack. To put that in perspective, in the first 24 hours the U.S. death toll would be 50 times greater than all American casualties in World War II. Not to mention the horrific aftermath of nuclear war. A 2014 study shows that so-called “limited” nuclear war in South Asia, in which 100 nuclear weapons are used, would have global consequences. Millions of tons of smoke would be sent into the atmosphere, plunging temperatures and damaging the global food supply. Two billion people would be at risk of death by starvation. How are No First Use commitments a step toward the goal of eliminating all nuclear weapons? Global No First Use would be an important step toward making nuclear weapons irrelevant to national security. These policies would strip nuclear weapons of value in the eyes of military planners, enable future nuclear disarmament negotiations, and accelerate the dismantling of these weapons. It would also serve as a “confidence-building measure” that establishes greater trust among nuclear-armed countries and makes it easier to work together to reduce nuclear risks and ultimately eliminate all nuclear weapons. No First Use in the United States What does current United States policy say about the first use of nuclear weapons? The 2018 U.S. Nuclear Posture Review (NPR) maintains the policy “the United States would only consider the employment of nuclear weapons in extreme circumstances to defend the vital interests of the United States, its allies, and partners.” This loose language holds open the possibility that nuclear weapons would be used in an initial attack (which can be ordered by the president, whose authority to use nuclear weapons is virtually limitless) or in response to a conventional, biological, chemical or cyber attack. Who would believe a U.S. NFU policy? Making a NFU policy credible — establishing it as a commitment that other countries can count on — means going beyond simple declaratory statements. This would require meaningful changes to the kinds of nuclear weapons the United States builds and the way it deploys them. One tangible way to show your NFU policy means something is to take all nuclear weapons off high-alert, meaning they are no longer ready to launch instantly. Another is to eliminate all land-based nuclear missiles (also known as intercontinental ballistic missiles, or ICBMs), which are by definition nuclear first-strike weapons, and prioritize the kinds of systems that would be used only in response to a nuclear attack. More recommendations for what the U.S. nuclear arsenal could look like under a guiding principle of NFU can be found in Global Zero’s Alternative U.S. Nuclear Posture Review. How would adoption of a NFU policy affect national security? Don’t we need to keep all our options on the table to deter our enemies? There exists no plausible circumstance in which the use of a nuclear weapon would be in the national security interests of the United States, American people, or U.S. allies. A nuclear counterattack following a U.S. first strike would be catastrophic, resulting in the deaths of millions of Americans and the total devastation of economic and social infrastructure. Any first use against lesser threats, such as countries or terrorist groups with chemical and biological weapons, would be gratuitous; there are very effective alternative means of countering those threats. There is little evidence to suggest nuclear weapons are effective in deterring non-nuclear attacks, including biological and chemical use. If the United States suffered a non-nuclear attack, it is difficult to imagine any president considering using nuclear weapons — destroying entire cities and killing hundreds of thousands of people, damaging the environment for generations, spreading deadly radiation possibly to uninvolved countries — in retaliation. Is there support for U.S. adoption of NFU? There is growing momentum for NFU in the United States. A 2016 poll showed at least two-thirds of Americans support NFU. Senator Elizabeth Warren (D-MA) and Chairman of the House Armed Services Committee Representative Adam Smith (D-WA9) have introduced the No First Use Act (S.1219/H.R.2603) which states, “It is the policy of the United States to not use nuclear weapons first.” A number of former senior-level military commanders and government officials support U.S. adoption of NFU, including former Vice Chair of the Joint Chiefs of Staff General (ret.) James E. Cartwright, Ambassador Thomas Pickering, and former Secretary of Defense William Perry. How would adoption of No First Use affect U.S. commitments to its allies and partners? Would they be encouraged to develop their own nuclear arsenals? NFU in no way reduces the ability of the United States to deter nuclear attacks on the U.S. or its allies. Allies would be able to rely on the superior capabilities of U.S. non-nuclear forces, which are sufficient to deal with threats to the U.S. and its allies, including biological or chemical weapons threats. A NFU policy would also help allay apprehensions among some allies about the U.S. using nuclear weapons first in a conflict. The first use of nuclear weapons against Russia or China would invite massive retaliation against the U.S. and its allies. First use against lesser threats like North Korea could result in blanketing allies or others uninvolved in the conflict with deadly radioactive fallout. A 2016 Global Zero study that looked at the potential for a NFU policy to encourage proliferation by U.S. allies with extended deterrence agreements found no evidence that a country’s decision to remain non-nuclear was based on its expectation that the United States would conduct a nuclear first strike on its behalf. The reliability of commitments to second-strike and conventional (non-nuclear) defense were found to be more important to extended deterrence. A move to develop nuclear weapons would also go against allied obligations under the Nuclear Non-Proliferation Treaty. Is it true the U.S. President has the sole authority to order the launch of nuclear weapons? What effect does NFU have on that authority? Every American president has sole authority to order the launch of nuclear weapons. No one — not Congress, not the secretary of defense, not the chairman of the Joint Chiefs of Staff — can veto his or her decision. That means under the current system, one person has the power to start a nuclear war at any time, for any reason. A legally-binding NFU policy would change that by making the first use of nuclear weapons illegal, clearly limiting the circumstances under which a president’s nuclear launch order could be executed. What can I do to make No First Use the policy of the United States? Global Zero is working every day to make No First Use a reality all of the nuclear-armed countries of the world, including the United States. If you’d like to support the work of our experts and advocates, please chip in here. Your donation will fund our work to educate policymakers, the public and the press, and help build a broad base of political support for this critical next step on the road to zero. If you’re interested in rolling up your sleeves and getting more involved, check out Beyond the Bomb, a grassroots organization building a people-powered movement to prevent nuclear war. You can sign the No First Use pledge to let your representatives know where you stand and get updates about key moments when your voice will make the biggest impact on your elected officials.

### 1NC --- OFF

#### Xi’s regime is stable now, but its success depends on strong growth and private sector development.

**Mitter and Johnson 21** [Rana Mitter and Elsbeth Johnson, [Rana Mitter](https://hbr.org/search?term=rana%20mitter&search_type=search-all) is a professor of the history and politics of modern China at Oxford. [Elsbeth Johnson](https://hbr.org/search?term=elsbeth%20johnson&search_type=search-all), formerly the strategy director for Prudential PLC’s Asian business, is a senior lecturer at MIT’s Sloan School of Management and the founder of SystemShift, a consulting firm. May-June 2021, "What the West Gets Wrong About China," Harvard Business Review, [https://hbr.org/2021/05/what-the-west-gets-wrong-about-china accessed 12/14/21](https://hbr.org/2021/05/what-the-west-gets-wrong-about-china%20accessed%2012/14/21)] Adam

In China, however, growth has come in the context of stable communist rule, suggesting that democracy and growth are not inevitably mutually dependent. In fact, many Chinese believe that the country’s recent economic achievements—large-scale poverty reduction, huge infrastructure investment, and development as a world-class tech innovator—have come about because of, not despite, China’s authoritarian form of government. Its aggressive handling of Covid-19—in sharp contrast to that of many Western countries with higher death rates and later, less-stringent lockdowns—has, if anything, reinforced that view.

China has also defied predictions that its authoritarianism would inhibit its capacity to [innovate](https://hbr.org/2011/06/what-the-west-doesnt-get-about-china). It is a global leader in AI, biotech, and space exploration. Some of its technological successes have been driven by market forces: People wanted to buy goods or communicate more easily, and the likes of Alibaba and Tencent have helped them do just that. But much of the technological progress has come from a highly innovative and well-funded military that has invested heavily in China’s burgeoning new industries. This, of course, mirrors the role of U.S. defense and intelligence spending in the development of Silicon Valley. But in China the consumer applications have come faster, making more obvious the link between government investment and products and services that benefit individuals. That’s why ordinary Chinese people see Chinese companies such as Alibaba, Huawei, and TikTok as sources of national pride—international vanguards of Chinese success—rather than simply sources of jobs or GDP, as they might be viewed in the West.

Thus July 2020 polling data from the Ash Center at Harvard’s Kennedy School of Government revealed 95% satisfaction with the Beijing government among Chinese citizens. Our own experiences on the ground in China confirm this. Most ordinary people we meet don’t feel that the authoritarian state is solely oppressive, although it can be that; for them it also provides opportunity. A cleaner in Chongqing now owns several apartments because the CCP reformed property laws. A Shanghai journalist is paid by her state-controlled magazine to fly around the world for stories on global lifestyle trends. A young student in Nanjing can study propulsion physics at Beijing’s Tsinghua University thanks to social mobility and the party’s significant investment in scientific research.

#### Xi has committed to the commercial space industry as the linchpin of China’s rise – the plan is seen as a complete 180

**Patel 21** [Neel V. Patel, Neel is a space reporter for MIT Technology Review. 1-21-2021, "China’s surging private space industry is out to challenge the US," MIT Technology Review, <https://www.technologyreview.com/2021/01/21/1016513/china-private-commercial-space-industry-dominance/> accessed 12/14/21] Adam

Until recently, China’s space activity has been overwhelmingly dominated by two state-owned enterprises: the China Aerospace Science & Industry Corporation Limited (CASIC) and the China Aerospace Science and Technology Corporation (CASC). A few private space firms have been allowed to operate in the country for a while: for example, there’s the China Great Wall Industry Corporation Limited (in reality a subsidiary of CASC), which has provided commercial launches since it was established in 1980. But for the most part, China’s commercial space industry has been nonexistent. Satellites were expensive to build and launch, and they were too heavy and large for anything but the biggest rockets to actually deliver to orbit. The costs involved were too much for anything but national budgets to handle.

That all changed this past decade as the costs of making satellites and launching rockets plunged. In 2014, a year after Xi Jinping took over as the new leader of China, the Chinese government decided to treat civil space development as a key area of innovation, as it had already begun doing with AI and solar power. It issued a policy directive called [Document 60](https://archive.md/o/bc9l4/www.cpppc.org/en/zy/994006.jhtml) that year to enable large private investment in companies interested in participating in the space industry.

“Xi’s goal was that if China has to become a critical player in technology, including in civil space and aerospace, it was critical to develop a space ecosystem that includes the private sector,” says Namrata Goswami, a geopolitics expert based in Montgomery, Alabama, who’s been studying China’s space program for many years. “He was taking a cue from the American private sector to encourage innovation from a talent pool that extended beyond state-funded organizations.”

As a result, there are now 78 commercial space companies operating in China, according to a[2019 report by the Institute for Defense Analyses](https://archive.md/o/bc9l4/https:/www.ida.org/-/media/feature/publications/e/ev/evaluation-of-chinas-commercial-space-sector/d-10873.ashx). More than half have been founded since 2014, and the vast majority focus on satellite manufacturing and launch services.

For example, Galactic Energy, founded in February 2018, is building its Ceres rocket to offer rapid launch service for single payloads, while its Pallas rocket is being built to deploy entire constellations. Rival company i-Space, formed in 2016, became the first commercial Chinese company to make it to space with its Hyperbola-1 in July 2019. It wants to pursue reusable first-stage boosters that can land vertically, like those from SpaceX. So does LinkSpace (founded in 2014), although it also hopes to use rockets to deliver packages from one terrestrial location to another.

Spacety, founded in 2016, wants to turn around customer orders to build and launch its small satellites in just six months. In December it launched a miniaturized version of a satellite that uses 2D radar images to build 3D reconstructions of terrestrial landscapes. Weeks later, it [released the first images taken by the satellite](https://archive.md/o/bc9l4/https:/spacenews.com/spacety-releases-first-sar-images/), Hisea-1, featuring three-meter resolution. Spacety wants to launch a constellation of these satellites to offer high-quality imaging at low cost.

To a large extent, China is following the same blueprint drawn up by the US: using government contracts and subsidies to give these companies a foot up. US firms like SpaceX benefited greatly from NASA contracts that paid out millions to build and test rockets and space vehicles for delivering cargo to the International Space Station. With that experience under its belt, SpaceX was able to attract more customers with greater confidence.

Venture capital is another tried-and-true route. The IDA report estimates that VC funding for Chinese space companies was up to $516 million in 2018—far shy of the $2.2 billion American companies raised, but nothing to scoff at for an industry that really only began seven years ago. At least 42 companies had no known government funding.

And much of the government support these companies do receive doesn’t have a federal origin, but a provincial one. “[These companies] are drawing high-tech development to these local communities,” says Hines. “And in return, they’re given more autonomy by the local government.” While most have headquarters in Beijing, many keep facilities in Shenzhen, Chongqing, and other areas that might draw talent from local universities.

There’s also one advantage specific to China: manufacturing. “What is the best country to trust for manufacturing needs?” asks James Zheng, the CEO of Spacety’s Luxembourg headquarters. “It’s China. It’s the manufacturing center of the world.” Zheng believes the country is in a better position than any other to take advantage of the space industry’s new need for mass production of satellites and rockets alike.

Making friends

The most critical strategic reason to encourage a private space sector is to create opportunities for international collaboration—particularly to attract customers wary of being seen to mix with the Chinese government. (US agencies and government contractors, for example, are barred from working with any groups the regime funds.) Document 60 and others issued by China’s National Development and Reform Commission were aimed not just at promoting technological innovation, but also at drawing in foreign investment and maximizing a customer base beyond Chinese borders.

“China realizes there are certain things they cannot get on their own,” says Frans von der Dunk, a space policy expert at the University of Nebraska–Lincoln. Chinese companies like LandSpace and MinoSpace have worked to accrue funding through foreign investment, escaping dependence on state subsidies. And by avoiding state funding, a company can also avoid an array of restrictions on what it can and can’t do (such as constraints on talking with the media). Foreign investment also makes it easier to compete on a global scale: you’re taking on clients around the world, launching from other countries, and bringing talent from outside China.

Although China is taking inspiration from the US in building out its private industry, the nature of the Chinese state also means these new companies face obstacles that their rivals in the West don’t have to worry about. While Chinese companies may look private on paper, they must still submit to government guidance and control, and accept some level of interference. It may be difficult for them to make a case to potential overseas customers that they are independent. The distinction between companies that are truly private and those that are more or less state actors is still quite fuzzy, especially if the government is a frequent customer. “That could still lead to a lack of trust from other partners,” says Goswami. It doesn’t help that the government itself is often [very cagey about what its national program is even up to](https://archive.md/o/bc9l4/https:/www.bbc.com/news/science-environment-54076895).

And Hines adds that it’s not always clear exactly how separate these companies are from, say, the People’s Liberation Army, given the historical ties between the space and defense sectors. “Some of these things will pose significant hurdles for the commercial space sector as it tries to expand,” he says.

#### Shifts in regime perception threatens CCP’s legitimacy from nationalist hardliners

Weiss 19 Jessica Weiss 1-29-2019 “Authoritarian Audiences, Rhetoric, and Propaganda in International Crises: Evidence from China” <http://www.jessicachenweiss.com/uploads/3/0/6/3/30636001/19-01-24-elite-statements-isq-ca.pdf> (Associate Professor of Government at Cornell University)//Elmer

Public support—or the appearance of it—matters to many autocracies. As Ithiel de Sola Pool writes, modern dictatorships are “highly conscious of public opinion and make major efforts to affect it.”6 Mao Zedong told his comrades: “When you make revolution, you must first manage public opinion.”7 Because autocracies often rely on **nationalist mythmaking**,8 success or failure in defending the national honor in international crises could burnish the leadership’s patriotic credentials or spark opposition. **Shared outrage at the regime’s foreign policy failures could galvanize street protests or elite fissures, creating intraparty upheaval** or inviting military officers to step in to restore order. Fearing a domestic backlash, authoritarian leaders may feel compelled to take a tough international stance. Although authoritarian leaders are rarely held accountable to public opinion through free and fair elections, fears of popular unrest and irregular ouster often weigh heavily on autocrats seeking to maximize their tenure in office. Considering the harsh consequences that authoritarian elites face if pushed out of office, even a small increase in the probability of ouster could alter authoritarian incentives in international crises.9 A history of nationalist uprisings make Chinese citizens and leaders especially aware of the linkage between international disputes and domestic unrest. The weakness of the PRC’s predecessor in defending Chinese sovereignty at the Paris Peace Conference in 1919 galvanized protests and a general strike, forcing the government to sack three officials and reject the Treaty of Versailles, which awarded territories in China to Japan. These precedents have made Chinese officials particularly sensitive to the appearance of hewing to public opinion. As the People’s Daily chief editor wrote: “History and reality have shown us that public opinion and regime safety are inseparable.”10 One Chinese scholar even claimed: “the Chinese government probably knows the public’s opinion better and reacts to it more directly than even the U.S. government.”11

#### Xi will launch diversionary war to domestic backlash – escalates in multiple hotspots

Norris 17, William J. Geostrategic Implications of China’s Twin Economic Challenges. CFR Discussion Paper, 2017. (Associate professor of Chinese foreign and security policy at Texas A&M University’s Bush School of Government and Public Service)//Elmer

Populist pressures might tempt the **party leadership** to encourage **diversionary nationalism**. The logic of this concern is straightforward: the Communist Party might seek to **distract a restless domestic population** with **adventurism abroad**.19 The **Xi** administration wants to **appear tough** in its **defense of foreign encroachments** against China’s interests. This need stems from a long-running narrative about how a weak Qing dynasty was unable to defend China in the face of European imperial expansion, epitomized by the Opium Wars and the subsequent treaties imposed on China in the nineteenth century. The party is **particularly sensitive** to **perceptions of weakness** because much of its **claim to legitimacy**—manifested in **Xi’s Chinese Dream** campaign today—stems from the party’s claims of leading the **restoration of Chinese greatness**. For example, the May Fourth Movement, a popular protest in 1919 that helped catalyze the CPC, called into question the legitimacy of the Republic of China government running the country at that time because the regime was seen as not having effectively defended China’s territorial and sovereignty interests at the Versailles Peace Conference. **Diversionary nationalist frictions** would likely occur if the Chinese leadership portrayed a foreign adversary as having made the first move, thus forcing Xi to stand up for China’s interests. An example is the 2012 attempt by the nationalist governor of Tokyo, Shintaro Ishihara, to buy the Senkaku/Diaoyu Islands from a private owner.20 Although the Japanese central government sought to avert a crisis by stepping in to purchase the islands—having them bought and administered by Ishihara’s Tokyo metropolitan government would have dragged Japan into a confrontation with China—China saw this move as part of a deliberate orchestration by Japan to nationalize the islands. Xi seemingly had no choice but to defend China’s claims against an attempt by Japan to consolidate its position on the dispute.21 This issue touched off a period of heated tensions between China and Japan, lasting more than two years.22 Such dynamics are not limited to Japan. Other possible areas of conflict include, but are not necessarily limited to, **Taiwan**, **India**, and the **South China Sea** (especially with the **Philippines** and **Vietnam**). The Chinese government will use such tactics if it believes that the costs are relatively low. Ideally, China would like to appear tough while avoiding material repercussions or a serious diplomatic breakdown. Standing up against foreign encroachment—without facing much blowback—could provide Xi’s administration with a tempting source of noneconomic legitimacy. However, over the next few years, Xi will probably not be actively looking to get embroiled abroad. Cushioning the fallout from slower growth while managing a structural economic transition will be difficult enough. Courting potential international crises that distract the central leadership would make this task even more daunting. Even if the top leadership did not wish to provoke conflict, a smaller budgetary allotment for security could cause **military interests** in China to **deliberately instigate trouble** to **justify** their **claims over increasingly scarce resources**. For example, an air force interested in ensuring its funding for a midair tanker program might find the existence of far-flung territorial disputes to be useful in making its case. Such a case would be made even stronger by a pattern of recent frictions that highlights the necessity of greater air power projection. Budgetary pressures may be partly behind a recent People’s Liberation Army reorganization and headcount reduction. A slowing economy might cause a further deceleration in China’s military spending, thus increasing such pressures as budgetary belts tighten. Challenges to Xi’s Leadership Xi Jinping’s efforts to address economic challenges could fail, unleashing consequences that extend well beyond China’s economic health. For example, an **economic collapse** could give rise to a Vladimir **Putin–like redemption figure** in China. Xi’s approach of centralizing authority over a diverse, complex, and massive social, political, and economic system is a **recipe for brittleness**. Rather than designing a resilient, decentralized governance structure that can gracefully cope with localized failures at particular nodes in a network, a highly centralized architecture **risks catastrophic**, **system-level failure**. Although centralized authority offers the tantalizing chimera of stronger control from the center, it also puts all the responsibility squarely on Xi’s shoulders. With China’s ascension to great power status, the consequences of internecine domestic political battles are increasingly playing out on the world stage. The international significance of China’s domestic politics is a new paradigm for the Chinese leadership, and one can expect an adjustment period during which the outcome of what had previously been relatively insulated domestic political frictions will likely generate **unintended international repercussions**. Such dynamics will influence Chinese foreign policy and security behavior. Domestic arguments over ideology, bureaucratic power struggles, and strategic direction could all have **ripple effects abroad**. Many of China’s party heavyweights still employ a narrow and exclusively domestic political calculus. Such behavior increases the possibility of international implications that are not fully anticipated, **raising the risks** of **strategic miscalculation** on the world stage. For example, the factional power struggles that animated the Cultural Revolution were largely driven by domestic concerns, yet manifested themselves in Chinese foreign policy for more than a decade. During this period, China was not the world’s second largest economy and, for much of this time, did not even have formal representation at the United Nations. If today’s globally interconnected China became engulfed in similar domestic chaos, the effects would be felt worldwide.23 Weakened Fetters of Economic Interdependence If China successfully transitioned away from its export-driven growth model toward a consumption-driven economic engine over the next four or five years, it could no longer feel as constrained by economic interdependence. To the extent that such constraints are loosened, the U.S.-China relationship will be more prone to conflict and friction.24 While China has never been the archetypal liberal economic power bent on benign integration with the global economy, its export-driven growth model produced a strong strategic preference for stability. Although past behavior is not necessarily indicative of future strategic calculus, China’s “economic circuit breaker” logic seems to have held its most aggressive nationalism below the threshold of war since 1979. A China that is both comparatively strong and less dependent on the global economy would be a novel development in modern geopolitics. As China changes the composition of its international economic linkages, global integration could place fewer constraints on it. Whereas China has been highly reliant on the import of raw materials and semifinished goods for reexport, a consumption-driven China could have a different international trade profile. China could still rely on imported goods, but their centrality to the country’s overall economic growth would be altered. Imports of luxury goods, consumer products, international brands, and services may not exert a significant constraining influence, since loss of access to such items may not be seen as strategically vital. If these flows were interrupted or jeopardized, the result would be more akin to an inconvenience than a strategic setback for China’s rise. That said, China is likely to continue to highly depend on imported oil even if the economic end to which that energy resource is directed shifts away from industrial and export production toward domestic consumption.

#### US–China war goes nuclear – crisis mis-management ensures conventional escalation - extinction

Kulacki 20 [Dr. Gregory Kulacki focuses on cross-cultural communication between the United States and China on nuclear and space arms control and is the China Project Manager for the Global Security Program at the Union of Concerned Scientists, 2020. Would China Use Nuclear Weapons First In A War With The United States?, Thediplomat.com, https://thediplomat.com/2020/04/would-china-use-nuclear-weapons-first-in-a-war-with-the-united-states/] srey

Admiral Charles A. Richard, the head of the U.S. Strategic Command, recently told the Senate Armed Service Committee he “could drive a truck” through the holes in China’s no first use policy. But when Senator John Hawley (R-MO) asked him why he said that, Commander Richard backtracked, described China’s policy as “very opaque” and said his assessment was based on “very little” information. That’s surprising. **China** has been exceptionally **clear** **about** its **intentions** **on** the possible **first** **use** **of** **nuclear** **weapons**. On the day of its first nuclear test on October 16, 1964, China declared it “will never at any time or under any circumstances be the first to use nuclear weapons.” That **unambiguous** **statement** **has** **been** a **cornerstone** **of** **Chinese** **nuclear** **weapons** policy for 56 years and has been repeated frequently in authoritative Chinese publications for domestic and international audiences, including a highly classified training manual for the operators of China’s nuclear forces. Richard should know about those publications, particularly the training manual. A U.S. Department of Defense translation has been circulating within the U.S. nuclear weapons policy community for more than a decade. The commander’s comments to the committee indicate a familiarity with the most controversial section of the manual, which, in the eyes of some U.S. analysts, indicates there may be some circumstances where **China** **would** **use** **nuclear** **weapons** **first** **in** a **war** **with** **the** **U**nited **S**tates. This U.S. misperception is understandable, especially given the difficulties the Defense Department encountered translating the text into English. The language, carefully considered in the context of the entire book, articulates a strong reaffirmation of China’s no first use policy. But it also reveals **Chinese** military planners are **struggling** **with** **crisis** **management** **and** **considering** **steps** **that** could **create** **ambiguity** **with** **disastrous** **consequences**. Towards the end of the 405-page text on the operations of China’s strategic rocket forces, in a chapter entitled, “Second Artillery Deterrence Operations,” the authors explain what China’s nuclear forces train to do if **“**a strong military power possessing nuclear‐armed missiles and an absolute advantage in high‐tech conventional weapons is carrying out intense and continuous attacks against our major strategic targets and we have no good military strategy to resist the enemy.**”** The military power they’re talking about is the United States. The authors indicate China’s nuclear missile forces train to take specific steps, including increasing readiness and conducting launch exercises, to “dissuade the continuation of the strong enemy’s conventional attacks.” The manual refers to these steps as an “adjustment” to China’s nuclear policy and a “lowering” of China’s threshold for brandishing its nuclear forces. Chinese leaders would only take these steps in extreme circumstances. The text highlights several triggers such as U.S. conventional bombing of China’s nuclear and hydroelectric power plants, heavy conventional bombing of large cities like Beijing and Shanghai, or other acts of **conventional** **warfare** **that** “**seriously** **threatened**” the “safety and **survival**” of the nation. U.S. Misunderstanding Richard seems to believe this planned adjustment in China’s nuclear posture means China is **preparing** **to** **use** **nuclear** **weapons** first under these circumstances. He told Hawley that there are a “number of situations where they may conclude that first use has occurred that do not meet our definition of first use.” The head of the U.S. Strategic Command appears to assume, as do other U.S. analysts, that the **Chinese** would **interpret** **these** types of U.S. conventional **attacks** **as** **equivalent** **to** a **U.S. first use** **of** **nuclear** **weapons** against China. But that’s not what the text says. “Lowering the threshold” refers to China putting its nuclear weapons on alert — it does not indicate Chinese leaders might lower their threshold for deciding to use nuclear weapons in a crisis. Nor does the text indicate Chinese nuclear forces are training to launch nuclear weapons first in a war with the United States. China, unlike the United States, keeps its nuclear forces off-alert. Its warheads are not mated to its missiles. China’s nuclear-armed submarines are not continuously at sea on armed patrols. The manual describes how China’s nuclear warheads and the missiles that deliver them are controlled by two separate chains of command. Chinese missileers train to bring them together and launch them after China has been attacked with nuclear weapons. All of these behaviors are consistent with a no first use policy. The “adjustment” Chinese nuclear forces are preparing to make if the United States is bombing China with impunity is to place China’s nuclear forces in a state of readiness similar to the state the nuclear forces of the United States are in all the time. This step is intended not only to end the bombing, but also to convince U.S. decision-makers they cannot expect to destroy China’s nuclear retaliatory capability if the crisis escalates. Chinese Miscalculation Unfortunately, alerting Chinese nuclear forces at such a moment could have terrifying consequences. Given the relatively small size of China’s nuclear force, a U.S. president might be tempted to try to limit the possible damage from a Chinese nuclear attack by destroying as many of China’s nuclear weapons as possible before they’re launched, especially if the head of the U.S. Strategic Command told the president China was preparing to strike first. One study concluded that if the United States used nuclear weapons to attempt to knock out a small fraction of the Chinese ICBMs that could reach the United States it may kill tens of millions of Chinese civilians. The authors of the text assume alerting China’s nuclear forces would “create a great shock in the enemy’s psyche.” That’s a fair assumption. But they also assume this shock could “dissuade the continuation of the strong enemy’s conventional attacks against our major strategic targets.” That’s highly questionable. There is a **substantial** **risk** **the** **U**nited **S**tates **would** **respond** **to** this implicit **Chinese** **threat** **to** **use** **nuclear** **weapons** **by** **escalating**, rather than halting, its **conventional** **attacks**. If China’s nuclear forces were targeted, it would put even greater strain on the operators of China’s nuclear forces. A **slippery** **slope** **to** **nuclear** **war** Chinese military planners are aware that attempting to coerce the United States into halting conventional bombardment by alerting their nuclear forces could fail. They also know it might trigger a nuclear war. But if it does, they are equally clear China won’t be the one to start it. Nuclear attack is often preceded by nuclear coercion. Because of this, in the midst of the process of a high, strong degree of nuclear coercion we should prepare well for a nuclear retaliatory attack. The more complete the preparation, the higher the credibility of nuclear coercion, the easier it is to accomplish the objective of nuclear coercion, and the lower the possibility that the nuclear missile forces will be used in actual fighting. They assume if China demonstrates it is well prepared to retaliate the United States would not risk a damage limitation strike using nuclear weapons. And even if the United States were to attack China’s nuclear forces with conventional weapons, China still would not strike first. In the opening section of the next chapter on “nuclear retaliatory attack operations” the manual instructs, as it does on numerous occasions throughout the entire text: According to our country’s principle, its stand of no first use of nuclear weapons, the Second Artillery will carry out a nuclear missile attack against the enemy’s important strategic targets, according to the combat orders of the Supreme Command, only after the enemy has carried out a nuclear attack against our country. Richard is wrong. There are no holes in China’s no first use policy. But the worse-case planning articulated in this highly classified military text is a significant and deeply troubling departure from China’s traditional thinking about the role of nuclear weapons. Mao Zedong famously called nuclear weapons “a paper tiger.” Many assumed he was being cavalier about the consequences of nuclear war. But what he meant is that they would not be used to fight and win wars. U.S. nuclear threats during the Korean War and the Taiwan Strait Crisis in the 1950s – threats not followed by an actual nuclear attack – validated Mao’s intuition that nuclear weapons were primarily psychological weapons. Chinese leaders decided to acquire nuclear weapons to free their minds from what Mao’s generation called “**nuclear** **blackmail**.” A former director of China’s nuclear weapons laboratories told me China developed them so its leaders could “sit up with a straight spine.” Countering nuclear blackmail – along with compelling other nuclear weapons states to negotiate their elimination – were the only two purposes Chinese nuclear weapons were meant to serve. Contemporary Chinese military planners appear to have added a new purpose: compelling the United States to halt a conventional attack. Even though it only applies in extreme circumstances, it **increases** the **risk** **that** a **war** between the United States and China **will** **end** **in** a nuclear exchange with unpredictable and **catastrophic** **consequences**. Adding this new purpose could also be the first step on a slippery slope to an incremental broadening the role of nuclear weapons in Chinese national security policy. Americans would be a lot safer if we could avoid that. The United States government should applaud China’s no first use policy instead of repeatedly calling it into question. And it would be wise to adopt the same policy for the United States. If both countries declared they would never use nuclear weapons first it may not guarantee they can avoid a nuclear exchange during a military crisis, but it would make one far less likely.

## Case

### 1NC --- Solvency

#### Chinese space industry is overwhelmingly dominated by the government—private enterprises cannot exist independently under domestic law—private sector complementary to the public sector means 0 solvency

Nie 12-24 (Mingyan Nie, JD; Nanjing University of Aeronautics and Astronautics Department of Law; 12-24-2021; "The Growth of China’s Non-governmental Space Sector in the Context of Government Support for Public-Private Partnerships: An Assessment of Major Legal Challenges";S*pace Policy* (2021) https://doi.org/10.1016/j.spacepol.2021.101461., accessed 1-14-2022; JPark)

* PPPs = public-private partnerships
* Strict and opaque governmental regulation basically makes it impossible for private entities to act independently and are subsumed by the state
* Laws are deliberately unclear to maximize state control – e.g., classifying launch vehicles as weapons

In light of China’s recent policies and other measures, it is evident that decision-makers in the space industry intend to privatize space activities to meet urgent market demands and social goals, including promoting PPPs.19 However, the military dominates the Chinese space industry, and the government controls nearly all civil space activities, while state-owned companies conduct programs related to space exploration. These dynamics have led to an unclear administration of space activities that has created an unstable environment for the growth of private enterprises. In addition, the reality of military-dominated space activities has engendered harsh regulations for all non-governmental affairs related to space exploration. 3.1. Complex administration of space activities and the non-governmental participation The role of the military and the government in the space field has resulted in a complicated framework for governing space activities in China. SASTIND, which was established under the Ministry of Industry and Information Technology of the PRC (MIIT), is the main administrative body under the State Council tasked with coordinating and managing the country’s space activities20. The impact of China’s military on space activities is extremely relevant. The role of the Equipment Development Department (EDD), which belongs to the People’s Republic of China Central Military Commission,21 is also notable. The EDD is qualified to conduct space projects directly. For instance, the human spaceflight program and the launching infrastructure, including launching sites and the hub of China’s telemetry, tracking, and control network, are mainly operated by the EDD. Furthermore, the EDD collaborates with SASTIND to establish regulations, monitor their implementation, allocate research funds, and determine the qualification of private entities to enter the space industry [[17], p.13]. This complicated and opaque organizational structure is detrimental to the participation of private actors in space-related activities in China. Space facilities, including launching sites, are controlled by the military that does not distinguish the nature of space activities. Thus, private enterprises with a sole focus on developing commercial space activities will have to fulfill the same high-level military requirements as the government. Additionally, the co-existence of more than one administrative body with similar supervision functions impedes non-governmental enterprises’ involvement in space activities [[31], pp. 4–5]. 3.2. Strict supervision of non-governmental entry into the space field: focusing on launch activities and satellite development In contrast to the United States, which promotes private entities to comprehensively participate in numerous space areas through PPPs [5], existing Chinese PPP policies related to space activities stress the domains of space science research, the launching of commercial satellites, the manufacture and operation of satellites, space infrastructure construction, and so on.22 The newly defined scope of the new type of infrastructure in China contains satellite internet, which motivates the creation of PPPs in space programs, and demands the growth of private participants to succeed in doing so. The fields of most relevance to this are launching activities and satellite development (including micro-satellite). Furthermore, emerging non-governmental space corporations are mainly interested in developing their launching and satellite manufacturing capacities (including micro-satellites) [32]. This is consistent with the policy requirements and constitutes a good starting point for conducting space PPPs and will, in turn, contribute to the growth of the commercial space industry. However, the administration of the rules of these areas is unfavorable for the non-governmental sector. Concerning launch activities, in June 2019, SASTIND and EDD announced the ‘Notice on Promoting the Orderly Development of Commercial Launch Vehicles’ (2019 Notice) [33]. Commercial launch activities are divided into phases of research and development, manufacturing, and launching. For non-governmental entities that intend to get involved in any of these phases, authorization is required. However, conditions and other requirements for obtaining such permissions are unfavorable. For example, launch vehicles are identified as a weapon. Given that SASTIND provides authorization for the research, development, and manufacture of weapons, any related technology must comply with the ‘Regulation on the Administration of Licenses for Scientific Research and Production of Weapons and Equipment’23 and the ‘Measures for the Implementation of the License for Scientific Research and Production of Weapons and Equipment’.24 Furthermore, the 2019 Notice states that every applicant must receive support from the provincial government where its enterprise is registered. The involved provincial government must inform SASTIND by issuing a letter to express their support and elaborate supervision measures to ensure that relevant enterprises have conducted the authorized space activities in compliance with confidentiality, safety, security, and quality standards. Thus, before conducting authorized operations, a notification to SASTIND and the EDD is required. The requirements stipulated in the 2019 Notice are unfavorable to private entities starting space activities for many reasons. First, the 2019 Notice refers the notification process to the EDD. However, no further details are available on this procedure. Moreover, the specific functions of the EDD in this process are not explained. Second, the relevant provincial government’s letter is a prerequisite for applying to receive authorization. Also, the provincial government’s supervision measures are the primary basis for conducting permitted activities. However, how the applicants obtain the provincial government’s approval letter is unclear. Third, whether the supervision measures elaborated by the relevant provincial government are only applicable to the specific applicant or equally applicable to similar subsequent applicants is not addressed [[31], pp. 5–6]. In the context of conducting PPPs, provincial governments can act as the ‘public’ party, so if no specifics are clarified, it is difficult to ensure a fair legal environment for establishing PPPs in space, which may breed corruption. The launching phase is also strictly administrated. This phase mandates that the application of launching permits should generally be consistent with the ‘Interim Measures on the Administration of Permits for Civil Space Launch Project’, which was released in2002.25 However, an extra review process by the EDD has been added as the pre-condition for approving the permit. Furthermore, any launching activity should be carried out on officially authorized launching sites or testing grounds, administrated and controlled by the military department, and the rules thereof should be observed. When referring to the development of satellites, no regulations have been adopted thus far. Non-governmental enterprises that intend to invest in this field have to meet the requirements of national security safeguards. Accordingly, licenses are necessary. Since the government and military have historically been responsible for the research and manufacture of satellites, no specific rules applicable to the private sector can be found in this field. In 2008, the Aerospace Dongfanghong Development Ltd., Shenzhen (ADD Ltd.), a state-owned corporation, was established.26 This corporation focuses on micro-satellite development. It is the first Chinese company that received authorization to research and develop micro-satellites [35]. Before initiating micro-satellite development programs, this corporation established the ‘certified weapon and equipment quality management system’. Therefore, the corporation was qualified ‘as a weapon and equipment bearer’ and obtained permission to conduct weapon and equipment research and product and met the requirements of acting as a so-called ‘national secondary class confidential qualified corporation’.27 As a result, the ADD Ltd. example offers valuable insights into non-governmental entities that want to get involved in satellite development, especially micro-satellites, as part of the recent interest in building satellite-based interest as a new type of infrastructure. However, these conditions or qualifications are inconsistent with the fundamental policies of facilitating private growth in space-related activities. Specific rules must be formulated to remove or simplify the excessive obstacles that impede private participation in satellite development, including the development of micro-satellites and the implementation of relevant policies. Concerning the procedural requirements for satellites manufacturing, non-governmental enterprises have to get approval from the NDRC. These firms must submit application documents, including the files issued by the provincial development and reform commission, the application report, and the confidential agreement to begin work [36]. Similar to the launch permit application, these application requirements set forth by the NDRC allow for the provincial departments to determine the details of the process, creating an unstable legal environment for potential applicants. In brief, the inevitable growth of the private sector in space is the main reason for creating PPPs in space exploration. Yet, the current dominant role of the military in China’s space industry results in a complex administrative framework and strict requirements for those non-governmental entities willing to undertake space activities. This constrains the development of the private space sector that remains in an underdeveloped stage to date. In addition, ambiguous rules concerning the power of the relevant provincial departments in authorizing launching activities and satellite development make creating and effective implementation of space PPPs more difficult. However, given the growing importance of the private sector in the implementation of the PPP policies regarding space, the existing rules and regulations should be improved.

#### Private Chinese space ventures are subsumed by the public sphere and national interests under Xi

Patel '21 (Neel V. Patel; science and tech journalist, currently working as a senior editor at The Daily Beast and space reporter for MIT Tech Review; 1-21-2021; "China’s surging private space industry is out to challenge the US"; https://www.technologyreview.com/2021/01/21/1016513/china-private-commercial-space-industry-dominance/, MIT Technology Review, accessed 1-14-2022; JPark)

“The state is really great at large, ambitious projects like going to the moon or developing a large reconnaissance satellite,” says Lincoln Hines, a Cornell University researcher who focuses on Chinese foreign policy. “But it’s not responsive to meeting market needs”—one big way to encourage rapid technological growth and innovation. “I think the government thinks its commercial space sector can be complementary to the state,” he says. What are the market needs that Hines is referring to? Satellites, and rockets that can launch them into orbit. The space industry is undergoing a renaissance thanks to two big trends spurred by the commercial industry: we can make satellites for less money by making them smaller and using off-the-shelf hardware; and we can also make rockets for less money, by using less costly materials or reusing boosters after they’ve already flown (which SpaceX pioneered with its Falcon 9). These trends mean it is now cheaper to send stuff into space, and the services and data that satellites can offer have come down in price accordingly. China has seen an opportunity. A 2017 report by Bank of America Merrill Lynch estimates that the space industry could be worth up to $2.7 trillion by 2030. Setting foot on the moon and establishing a lunar colony might be a statement of national power, but securing a share of such a highly lucrative business is perhaps even more important to the country’s future. “In the future, there will be tens of thousands of satellites waiting to launch, which is a major opportunity for Galactic Energy” says Wu Yue, a company spokesperson. The problem is, China has to make up decades’ worth of ground lost to the West. How did China get here—and why? Until recently, China’s space activity has been overwhelmingly dominated by two state-owned enterprises: the China Aerospace Science & Industry Corporation Limited (CASIC) and the China Aerospace Science and Technology Corporation (CASC). A few private space firms have been allowed to operate in the country for a while: for example, there’s the China Great Wall Industry Corporation Limited (in reality a subsidiary of CASC), which has provided commercial launches since it was established in 1980. But for the most part, China’s commercial space industry has been nonexistent. Satellites were expensive to build and launch, and they were too heavy and large for anything but the biggest rockets to actually deliver to orbit. The costs involved were too much for anything but national budgets to handle. That all changed this past decade as the costs of making satellites and launching rockets plunged. In 2014, a year after Xi Jinping took over as the new leader of China, the Chinese government decided to treat civil space development as a key area of innovation, as it had already begun doing with AI and solar power. It issued a policy directive called Document 60 that year to enable large private investment in companies interested in participating in the space industry. “Xi’s goal was that if China has to become a critical player in technology, including in civil space and aerospace, it was critical to develop a space ecosystem that includes the private sector,” says Namrata Goswami, a geopolitics expert based in Montgomery, Alabama, who’s been studying China’s space program for many years. “He was taking a cue from the American private sector to encourage innovation from a talent pool that extended beyond state-funded organizations.” As a result, there are now 78 commercial space companies operating in China, according to a 2019 report by the Institute for Defense Analyses. More than half have been founded since 2014, and the vast majority focus on satellite manufacturing and launch services. For example, Galactic Energy, founded in February 2018, is building its Ceres rocket to offer rapid launch service for single payloads, while its Pallas rocket is being built to deploy entire constellations. Rival company i-Space, formed in 2016, became the first commercial Chinese company to make it to space with its Hyperbola-1 in July 2019. It wants to pursue reusable first-stage boosters that can land vertically, like those from SpaceX. So does LinkSpace (founded in 2014), although it also hopes to use rockets to deliver packages from one terrestrial location to another. Spacety, founded in 2016, wants to turn around customer orders to build and launch its small satellites in just six months. In December it launched a miniaturized version of a satellite that uses 2D radar images to build 3D reconstructions of terrestrial landscapes. Weeks later, it released the first images taken by the satellite, Hisea-1, featuring three-meter resolution. Spacety wants to launch a constellation of these satellites to offer high-quality imaging at low cost. To a large extent, China is following the same blueprint drawn up by the US: using government contracts and subsidies to give these companies a foot up. US firms like SpaceX benefited greatly from NASA contracts that paid out millions to build and test rockets and space vehicles for delivering cargo to the International Space Station. With that experience under its belt, SpaceX was able to attract more customers with greater confidence. Venture capital is another tried-and-true route. The IDA report estimates that VC funding for Chinese space companies was up to $516 million in 2018—far shy of the $2.2 billion American companies raised, but nothing to scoff at for an industry that really only began seven years ago. At least 42 companies had no known government funding. And much of the government support these companies do receive doesn’t have a federal origin, but a provincial one. “[These companies] are drawing high-tech development to these local communities,” says Hines. “And in return, they’re given more autonomy by the local government.” While most have headquarters in Beijing, many keep facilities in Shenzhen, Chongqing, and other areas that might draw talent from local universities. There’s also one advantage specific to China: manufacturing. “What is the best country to trust for manufacturing needs?” asks James Zheng, the CEO of Spacety’s Luxembourg headquarters. “It’s China. It’s the manufacturing center of the world.” Zheng believes the country is in a better position than any other to take advantage of the space industry’s new need for mass production of satellites and rockets alike. Making friends The most critical strategic reason to encourage a private space sector is to create opportunities for international collaboration—particularly to attract customers wary of being seen to mix with the Chinese government. (US agencies and government contractors, for example, are barred from working with any groups the regime funds.) Document 60 and others issued by China’s National Development and Reform Commission were aimed not just at promoting technological innovation, but also at drawing in foreign investment and maximizing a customer base beyond Chinese borders. “China realizes there are certain things they cannot get on their own,” says Frans von der Dunk, a space policy expert at the University of Nebraska–Lincoln. Chinese companies like LandSpace and MinoSpace have worked to accrue funding through foreign investment, escaping dependence on state subsidies. And by avoiding state funding, a company can also avoid an array of restrictions on what it can and can’t do (such as constraints on talking with the media). Foreign investment also makes it easier to compete on a global scale: you’re taking on clients around the world, launching from other countries, and bringing talent from outside China. Although China is taking inspiration from the US in building out its private industry, the nature of the Chinese state also means these new companies face obstacles that their rivals in the West don’t have to worry about. While Chinese companies may look private on paper, they must still submit to government guidance and control, and accept some level of interference. It may be difficult for them to make a case to potential overseas customers that they are independent. The distinction between companies that are truly private and those that are more or less state actors is still quite fuzzy, especially if the government is a frequent customer. “That could still lead to a lack of trust from other partners,” says Goswami. It doesn’t help that the government itself is often very cagey about what its national program is even up to. And Hines adds that it’s not always clear exactly how separate these companies are from, say, the People’s Liberation Army, given the historical ties between the space and defense sectors. “Some of these things will pose significant hurdles for the commercial space sector as it tries to expand,” he says.

#### The plan has no effect—private space ventures are inextricable from public interest.

Goswami '19 (Dr. Namrata Goswami; author, strategic analyst and consultant on counter-insurgency, counter-terrorism, alternate futures, and great power politics, worked at IDSA, selected as a Jennings-Randolph Senior Fellow, won MINERVA grant and contract with JSOU; 4-5-2019; "Misplaced Confidence? The US Private Space Sector vs. China"; https://thediplomat.com/2019/04/misplaced-confidence-the-us-private-space-sector-vs-china/, The Diplomat, accessed 1-14-2022; JPark)

Over the past three years, nearly 60 private space startups have entered the private launch industry, supported by the Chinese state. Spokesperson of the China National Space Administration (CNSA), Li Guoping, specified: The output value of the satellite application sector makes up over 80 percent of the whole satellite industry chain. So we encourage private companies and social capital to invest in the application of satellite communication, remote sensing and navigation…When we make a top-level plan for China’s aerospace development, we will consider the development of commercial space activity. The government will open space programs that can be carried out in a commercial way, and buy services from commercial companies… Since 2014, Xi has urged China’s private space sector to emerge as the leader in the “implementation of civil-military integration strategy.” Xi’s policy guidance has been followed up by the PLA, which opened its Jiuquan Satellite Launch Center (China’s primary launch facility) in the northwestern Gobi Desert for private rocket launches. This civil-military integration has been identified as a priority by Xi for China’s overall national strategy with regard to outer space. The planning chief of the Jiuquan Satellite Launch Center, Jia Lide, stated that “favorable policies and targeted measures have been created for the benefit of private space enterprises.” The latter point is particularly important. The U.S. private sector does very well with strong government support, through programs like Commercial Orbital Transportation System (COTS), Commercial Crew Program, and now the Commercial Lunar Payload Service (CLPS). Most U.S. space industries still rely to a significant degree on the government market either to get started or to stay solvent.

### 1NC --- Impact Defense

#### Mining war assumes trump, doesn’t say war is imminent, and says Russia is an alt cause.

#### Offensive capabilities are weak, there are lots of defenses---their ev is hype

Dr. Joan Johnson-Freese 16, Ph.D. in Political Science and International Relations from Kent State University, Chair of the Department of National Security Studies at the Naval War College, and Theresa Hitchens, Senior Research Scholar at the Center for International and Security Studies and Former Director of the United Nations Institute for Disarmament Research (UNIDIR), “Stop The Fearmongering Over War In Space: The Sky’s Not Falling, Part 1”, Breaking Defense, 12/27/2016, https://breakingdefense.com/2016/12/stop-the-fearmongering-over-war-in-space-the-skys-not-falling-part-1/

Star Wars it ain’t, but the Pentagon is increasingly anxious over threats to its satellites, as we’ve reported frequently in recent years. But in this op-ed, scholars Joan Johnson-Freese and Theresa Hitchens argue that war in space is dangerously overhyped. — the editors

In the last two years, we’ve seen rising hysteria over a future war in space. Fanning the flames are not only dire assessments from the US military, but also breathless coverage from a cooperative and credulous press. This reporting doesn’t only muddy public debate over whether we really need expensive systems. It could also become a self-fulfilling prophecy. The irony is that nothing makes the currently slim possibility of war in space more likely than fearmongering over the threat of war in space.

Two television programs in the past two years show how egregious this fearmongering can get. In April 2015, the CBS show 60 Minutes ran a segment called “The Battle Above.” In an interview with General John Hyten, the then-chief of U.S. Air Force Space Command, it came across loud and clear that the United States was being forced to prepare for a battle in space — specifically against China — that it really didn’t want.

Gen. John Hyten: It’s a competition that I wish wasn’t occurring, but it is. And if we’re threatened in space, we have the right of self-defense, and we’ll make sure we can execute that right.

David Martin: And use force if necessary.

Gen. John Hyten: That’s why we have a military. You know, I’m not NASA.

It was explained by Hyten and other guests that China is building a considerable amount of hardware and accumulating significant know-how regarding space, all threatening to space assets Americans depend on every day. If viewers weren’t frightened after watching the segment, it wasn’t for lack of trying on the part of CBS.

Using terms like “offensive counterspace” as a 1984 NewSpeak euphemism for “weapons,” it was made clear that the United States had no choice but to spend billions of dollars on offensive counterspace technology to not just thwart the Chinese threat, but control and dominate space. While it didn’t actually distort facts — just omit facts about current U.S. space capabilities — the segment was basically a cost-free commercial for the military-industrial complex.

In retrospect though, “The Battle Above” was pretty good compared to CNN’s recent special, War in Space: The Next Battlefield. The latter might as well have been called Sharknado in Space – because the only far-out weapons technology our potential adversaries don’t have, according to the broadcast, seems to be “sharks with frickin’ laser beams attached to their heads!”

First, CNN needs to hire some fact checkers. Saying “unlike its adversaries, the U.S. has not yet weaponized space” is deeply misleading, like saying “unlike his political opponents, President-Elect Donald Trump has not sprouted wings and flown away”: A few (admittedly alarming) weapons tests aside, no country in the world has yet weaponized space. Contrary to CNN, stock market transactions are not timed nor synchronized through GPS, but a closed system. Cruise missiles can find their targets even without GPS, because they have both GPS and precision inertial measurement units onboard, and IMUs don’t rely on satellite data. Oh, and the British rock group Pink Floyd holds the only claim to the Dark Side of the Moon: There is a “far side” of the Moon — the side always turned away from the Earth — but not a “dark side” — which would be a side always turned away from the Sun.

More nefariously, the segment sensationalized nuggets of truth within a barrage of half-truths, backed by a heavy bass, dramatic soundtrack (and gravelly-voiced reporter Jim Sciutto) and accompanied by sexy and scary visuals.

Make no mistake there are dangers in space, and the United States has the most to lose if space assets are lost. The question is how best to protect them. Here are a few facts CNN omitted.

The Reality

The U.S. has all of the technologies described on the CNN segment and deemed potentially offensive: maneuverable satellites, nano-satellites, lasers, jamming capabilities, robotic arms, ballistic missiles that can be used as anti-satellite weapons, etc. In fact, the United States is more technologically advanced than other countries in both military and commercial space.

That technological superiority scares other countries; just as the U.S. military space community is scared of other countries obtaining those technologies in the future. The U.S. military space budget is more than 10 times greater than that of all the countries in the world combined. That also causes other countries concern.

More unsettling still, the United States has long been leery of treaty-based efforts to constrain a potential arms race in outer space, as supported by nearly every other country in the world for decades. Indeed, under the administration of George W. Bush, the U.S. talking points centered on the mantra “there is no arms race in outer space,” so there is no need for diplomat instruments to constrain one. Now, a decade later, the U.S. military – backed by the Intelligence Community which operates the nation’s spy satellites – seems to be shouting to the rooftops that the United States is in danger of losing the space arms race already begun by its potential adversaries. The underlying assumption — a convenient one for advocates of more military spending — is that now there is nothing that diplomacy can do.

However, it must be remembered that most space-related technologies – with the exception of ballistic missiles and dedicated jammers – have both military and civil/commercial uses; both benign — indeed, helpful — and nefarious uses. For example, giving satellites the ability to maneuver on orbit can allow useful inspections of ailing satellites and possibly even repairs.

Further, the United States is not unable to protect its satellites, as repeated during the CNN broadcast by various interviewees and the host. Many U.S. government-owned satellites, including precious spy satellites, have capabilities to maneuver. Many are hardened against electro-magnetic pulse, sport “shutters” to protect optical “eyes” from solar flares and lasers, and use radio frequency hopping to resist jamming.

Offensive weapons, deployed on the ground to attack satellites, or in space, are not a silver bullet. To the contrary, U.S. deployment of such weapons may actually be detrimental to U.S. and international security in space (as we argued in a recent Atlantic Council publication, Towards a New National Security Space Strategy). Further, there are benefits to efforts started by the Obama Administration to find diplomatic tools to restrain and constrain dangerous military activities in space.

These diplomatic efforts, however, would be undercut by a full-out U.S. pursuit of “space dominance.” This includes dialogue with China, the lack of which Gen. William Shelton, retired commander of Air Force Space Command, lamented in the CNN report.

Given CNN’s “cast,” the spin was not surprising. Starting with Ghost Fleet author Peter Singer set the sensationalist tone, which never altered. The apocalyptic opening, inspired by Ghost Fleet, posited a scenario where all U.S. satellites are taken off-line in nearly one fell swoop. Unless we are talking about an alien invasion, that scenario is nigh on impossible. No potential adversary has such capabilities, nor will they ever likely do so. There is just too much redundancy in the system.

#### No space wars – zero scenarios for miscalc or escalation

**Pavur 19** [James, DPhil Researcher at the Cybersecurity Centre for Doctoral Training at Oxford University, and Ivan Martinovic, Professor of Computer Science in the Department of Computer Science at Oxford University, “The Cyber-ASAT: On the Impact of Cyber Weapons in Outer Space”, 2019 11th International Conference on Cyber Conflict: Silent Battle, <https://ccdcoe.org/uploads/2019/06/Art_12_The-Cyber-ASAT.pdf>]

A. Limited Accessibility Space is difficult. Over 60 years have passed since the first Sputnik launch and only nine countries (ten including the EU) have orbital launch capabilities. Moreover, a launch programme alone does not guarantee the **resources** and **precision required** to **operate a meaningful ASAT capability**. Given this, one possible reason why **space wars have not broken out** is simply because only the US has ever had the ability to fight one [21, p. 402], [22, pp. 419–420]. Although launch technology may become cheaper and easier, it is unclear to what extent these advances will be distributed among presently non-spacefaring nations. **Limited access to orbit** necessarily reduces the scenarios which could plausibly escalate to ASAT usage. Only major conflicts between the handful of states with ‘space club’ membership could be considered possible flashpoints. Even then, the **fragility of an attacker’s own space assets** creates **de-escalatory pressures** due to the **deterrent effect of retaliation**. Since the earliest days of the space race, dominant powers have recognized this dynamic and demonstrated an inclination **towards de-escalatory space strategies** [23]. B. Attributable Norms There also exists a **long-standing normative framework** favouring the **peaceful use of space**. The effectiveness of this regime, centred around the Outer Space Treaty (**OST**), is highly contentious and many have pointed out its serious legal and political shortcomings [24]–[26]. Nevertheless, this status quo framework has somehow supported over **six decades of relative peace** in orbit. Over these six decades, **norms have become deeply ingrained** into the way states describe and perceive space weaponization. This de facto codification was dramatically demonstrated in 2005 when the US found itself on the short end of a 160-1 UN vote after opposing a non-binding resolution on space weaponization. Although states have occasionally pushed the boundaries of these norms, this has typically occurred through incremental legal re-interpretation rather than outright opposition [27]. Even the most notable incidents, such as the 2007-2008 US and Chinese ASAT demonstrations, were couched in rhetoric from both the norm violators and defenders, depicting space as a peaceful global commons [27, p. 56]. Altogether, this suggests that **states perceive real costs** to breaking this normative tradition and may even **moderate their behaviours** accordingly. One further factor supporting this norms regime is the **high degree of attributability** surrounding ASAT weapons. For kinetic ASAT technology, **plausible deniability** and **stealth** are essentially **impossible**. The literally explosive act of launching a rocket cannot evade detection and, if used offensively, retaliation. This imposes **high diplomatic costs** on ASAT usage and testing, particularly during peacetime. C. Environmental Interdependence A third stabilizing force relates to the **orbital debris consequences** of ASATs. China’s 2007 ASAT demonstration was the largest debris-generating event in history, as the targeted satellite dissipated into thousands of dangerous debris particles [28, p. 4]. Since debris particles are indiscriminate and unpredictable, they often threaten the attacker’s own space assets [22, p. 420]. This is compounded by Kessler syndrome, a phenomenon whereby orbital debris ‘breeds’ as large pieces of debris collide and disintegrate. As space debris remains in orbit for hundreds of years, the **cascade effect** of an ASAT attack can constrain the attacker’s long-term use of space [29, pp. 295– 296]. Any state with kinetic ASAT capabilities will likely also operate satellites of its own, and they are necessarily exposed to this collateral damage threat. Space debris thus acts as a strong strategic deterrent to ASAT usage.

#### Limited Russia/China co-op is inevitable and won’t be stopped by U.S. engagement, but deep ties are impossible, have no impact, and are better contained by continued pressure

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So, now everybody wants to be Bismarck. They see themselves shaping history by artfully moving big pieces on the geostrategic chessboard. And one gambit they just can’t resist is moving to snip the growing bonds of Sino-Russian cooperation. My advice to them: Just stop. Fears of an allied China and Russia running amok around the world are overblown. Indeed, there is so much friction between these “friends,” any attempt to team up would likely give both countries heat rash. Siren’s Cat Call Here’s the lame narrative that’s animating the Bismarck wannabes: The United States is pushing back against Moscow and pressing Beijing. This is driving Moscow and Beijing closer together. Beijing and Moscow will then gang-up on the United States. To prevent this, the United States should make nice with Moscow (undermining the incipient Sino-Russian détente) and then focus on beating back against China. Yes, China and Russia are going to work together to some degree. They have important things in common. For example, both are unaccountable authoritarian regimes that share the Eurasian continent. Other indicators of compatibility: they like doing business with each other, and both like to make up their own rules. Heck, they don’t even have to pretend the liberal world order is a speed-bump in their joint ventures. Both happily engage with the world’s most odious regimes, from Syria to Venezuela. And, of course, neither has any compunction about playing dirty when it serves their interests. They already play off of each other to frustrate foreign-policy initiatives from Washington. For example, if the United States pressures Russia to vote a certain way on a measure before the UN Security Council, Russia will often don the white hat and vote as we desire, knowing that Beijing will veto the measure for them. Similarly, if the United States leans on Beijing stop giving North Korea some form of aid and comfort, Beijing can go along with the request, knowing that Moscow will pick up the baton for them. What the neo-Bismarcks need to ask themselves is: Why would Russia or China ever consider giving up these practices? Why would they make the ongoing great power competition easier for the United States? That makes no sense. That is not in their self-interest. Any notion that the United States could somehow seduce Russian president Vladimir Putin from playing house with Beijing is fanciful. Putin doesn’t do something for nothing; his price would be quite high. He could demand a free hand in Ukraine, or lifting sanctions, or squelching opposition to Nordstream II, or giving Russia free rein in the Middle East. Any of these “deals” would greatly compromise American interests. Why would we do that? And what, exactly, is Putin going to deliver in return? What leverage does Russia have on Beijing? The answer is not near enough to justify any of these concessions. On the other hand, what leverage would a Russia-China alliance have on the United States? They wouldn’t jointly threaten Washington with military action. A central element of both their strategies is that they want to win against the United States “without fighting.” Moscow might be happy if the United States got distracted in a military mix-up with China. Conversely, Beijing could okay with the Americans have an armed confrontation with the Russians. But, neither of them will be volunteering to go first anytime soon. Even if they linked arms to threaten the United States in tandem, the pain would not be worth the gain. As long as America maintains a credible global and strategic deterrent, a Sino-Russian military one-two punch is pretty much checkmated. Peace through strength really works. If direct military confrontation is out of bounds, then what can Beijing and Moscow do using economic, political, and diplomatic power or tools of hybrid warfare? The answer to that question is easy: exactly what they are already doing. We have plenty of evidence of on-going political warfare aimed at the United States, its friends, allies, and interests. Some of these activities are conducted in tandem; some are instances of copy-catism; and some are independent and original. The political warfare takes many forms—ranging from corrosive economic behavior to aggressive diplomacy to military expansionism and more. All these malicious efforts are a problem. What they don’t add up to is an existential threat to vital U.S. interests. In other words, we can handle this without sucking up to Putin and undermining our own interests. In fact, we already have a national-security strategy that adequately addresses these concerns. One more thing inhibiting a Sino-Russian hookup. Russian and Chinese power is largely asymmetrical. They have very different strengths and weaknesses. In coordinating their malicious activities against the United States, they don’t line out very well. China, for example, can’t really do anything substantive to help Russia in Syria. Putin doesn’t have much to offer in the South China Seas or in brokering a U.S.-China trade agreement. There are also limits to the Sino-Russia era of good feelings. Other than trying to take America down a notch, their global goals are not well aligned. Indeed, the more they try to cooperate, the more their disparate interests will grate on the relationship. For example, China is meddling more in Central Asia and the Arctic—spaces where Russia was dominant. Moscow has to ask itself: Why is Beijing elbowing in? There is an argument that rather than looking for a strategic partnership, China is just biding its time till Russia implodes, and Beijing steps in and sweeps up the choice pieces.

#### No China war

**Shifrinson 19** [Joshua Shifrinson is an assistant professor of international relations at Boston University. The ‘new Cold War’ with China is way overblown. Here’s why. February 8, 2019. https://www.washingtonpost.com/news/monkey-cage/wp/2019/02/08/there-isnt-a-new-cold-war-with-china-for-these-4-reasons/?noredirect=on&utm\_term=.f8ca8195c4e4]

Is a new Cold War looming — or already present — between the United States and China? Many analysts argue that a combination of geopolitics, ideology and competing visions of “global order” are driving the two countries toward emulating the Soviet-U.S. rivalry that dominated world politics from 1947 through 1990. But such concerns are overblown. Here are four big reasons why. 1. The historical backdrops of the two relationships are very different When the Cold War began, the U.S.-Soviet relationship was fragile and tenuous. Bilateral diplomatic relations were barely a decade old, U.S. intervention in the Russian Revolution was a recent memory, and the Soviet Union had called for the overthrow of capitalist governments into the 1940s. Despite their Grand Alliance against Nazi Germany, the two countries shared few meaningful diplomatic, economic or institutional links. In 2019, the situation between the United States and China is very different. Since the 1970s, diplomatic interactions, institutional ties and economic flows have all exploded. Although each side has criticized the other for domestic interference (such as U.S. demands for journalist access to Tibet and China’s espionage against U.S. corporations), these issues did not prevent cooperation on a host of other issues. Yes, there were tensions over the past decade, but these occurred against a generally cooperative backdrop. 2. Geography and powers’ nuclear postures suggest East Asia is more stable than Cold War-era Europe The Cold War was shaped by an intense arms race, nuclear posturing and crises, especially in continental Europe. Given Europe’s political geography, the United States feared a “bolt from the blue” attack would allow the Soviet Union to conquer the continent. Accordingly, the United States prepared to defend Europe with conventional forces, and to deter Soviet aggrandizement using nuclear weapons. Unsurprisingly, the Soviet Union also feared that the United States might attack and wanted to deter U.S. adventurism. Concerns that the other superpower might use force and that crises could quickly escalate colored Cold War politics. Today, the United States and China spend proportionally far less on their militaries than the United States and the Soviet Union did. Though an arms race may be emerging, U.S. and Chinese nuclear postures are not nearly as large or threatening: Arsenals remain far below the size and scope witnessed in the Cold War, and are kept at a lower state of alert. As for geography, East Asia is not primed for tensions akin to those in Cold War Europe. China can threaten to coerce its neighbors, but the water barriers separating China from most of Asia’s strategically important states make outright conquest significantly harder. Of course, as scholars such as Caitlin Talmadge and Avery Goldstein note, crises may still erupt, and each side may face pressures to escalate. Unlike the Cold War, however, U.S.-Chinese confrontations occur at sea with relatively limited forces and without clear territorial boundaries. This suggests there are countervailing factors that may give the two sides room to negotiate — and limit the speed with which a crisis unfolds.

#### Doesn’t go nuclear

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I read with interest Caitlin Talmadge’s article “Beijing’s Nuclear Option” (November/December 2018), in which she quotes me estimating in 2015 that the odds of a U.S.-Chinese nuclear exchange were “somewhere between nil and zero.” She then goes on to make a case against remaining complacent in the face of the risk of escalation, with no discussion of what is in fact a very high nuclear threshold in a U.S.-Chinese confrontation or conflict. I continue to believe that the chances of nuclear use are very small. Talmadge’s basic argument is that in any conflict with China, the United States will immediately launch a full-scale air and missile assault against military targets in mainland China and against Chinese attack submarines at sea. In so doing, she argues, the United States will inadvertently hit either China’s ballistic missile submarines or its mobile nuclear missiles. That, in turn, will present Chinese leaders with a “use it or lose it” dilemma concerning their nuclear arsenal, and they may well decide to launch a nuclear attack against the United States. Such a scenario is extremely unlikely; indeed, I would say the odds are somewhere between nil and zero. A U.S.-Chinese conflict would be a maritime campaign in which the two sides tried to conquer or defend islands. Attacks on land targets beyond the contested islands and the waters around them, whether carried out by the United States against Chinese territory or by China against U.S. overseas bases, would be aimed at military installations and systems that supported the maritime campaign—ports, air bases, and command-and-control centers. The intercontinental nuclear deterrent forces of both countries are physically separate from these facilities. In addition, U.S. planners are very mindful of the danger of attacking any state’s nuclear arsenal and take extraordinary precautions to avoid doing so. Although there is always a chance for an isolated mistake, it is in fact possible to distinguish nuclear-armed submarines from conventional ones. Likewise, it is possible to distinguish the shorter-range, dual-use missiles that threaten Taiwan, China’s neighbors, and U.S. bases in the Pacific from the intercontinental missiles that threaten the United States. If by mistake a U.S. strike destroyed a land-based medium-range nuclear missile or sank a ballistic missile submarine, China would be greatly concerned, but it is highly unlikely that Beijing would respond by reflexively launching a nuclear attack against the United States. Rather, before even considering violating their long-held “no first use” doctrine, Chinese leaders would wait to see if a concerted, sustained U.S. campaign against their nuclear arsenal was under way. The United States has no incentive to attempt such a campaign and in fact would take every precaution to avoid it. The real danger of escalation in these conflicts would be when a Chinese attempt to capture a disputed island—Taiwan, one of the Diaoyu/Senkaku Islands, or an island in the South China Sea—was failing. A failed attempt to regain territory that the Chinese government has claimed as its own would undermine the legitimacy of the Chinese Communist Party and could make Beijing desperate enough to threaten the use of nuclear weapons. Again, U.S. planners are aware of that danger and would seek to manage the end of a maritime conflict with China in a way that minimized the incentives for escalation.

#### Satellites key to drones and PGS

Jeremy Rabkin 17, Professor of Law at George Mason University; and John Yoo, Professor of Law at the University of California-Berkeley, 2017, Striking Power: How Cyber, Robots, and Space Weapons Change the Rules of War, p. 193-194

Since the end of the Cold War, space-based military systems have come to exert a more direct terrestrial impact. The global positioning system (GPS) allows U.S. aircraft, naval vessels, and ground units to locate their whereabouts and to direct their fire with precision. The stunning speed of the initial invasion of Iraq in 2003, like the earlier triumph of the Persian Gulf War in 1991, demonstrates the lethal success of military’ operations that integrate satellite communications and information gathering. The drone campaign against terrorist leaders in the Middle East and Pakistan depends on satellites to locate targets, conduct real-time surveillance, and then control the fire systems of the drones.

The future holds even more advances in store. Building on precision-guided munitions, the U.S. Defense Department is developing a “prompt global strike” system that will use GPS satellites to guide hypersonic missiles, armed with conventional warheads, to targets anywhere in the world within an hour.1 More exotic versions envision bombardments from orbital platforms using rods, which would generate their explosive force purely from the kinetic energy created by their high terminal velocity upon reentering the atmosphere. American planners speculate that such systems could replace the need for tactical nuclear weapons because of their combination of precision, speed, and destructive potential.

#### PGS causes destabilization and conflict.

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Undermining stability and deterrence

While past US Administrations have viewed CPGS as enhancing deterrence, these weapons have provoked intense debate, in particular how they will impact crisis stability. One of the most significant concerns is that Russia will view such weapons as a direct threat to its Strategic Nuclear Forces. Indeed, this outlook appears in Russian doctrine, and in policy statements in various international fora. For instance, at the 2015 Nuclear Non-proliferation Treaty Review Conference, the head of the Russian delegation stated that US policy hinders further nuclear reductions through its ‘intransigent course’, undermining strategic stability by pursuing, among other things, a missile defence system and the “prompt global strike” concept.[6] This is a consistent mantra. However, some argue that Russia overstates the danger to its forces. Russia is the only state beyond the US with a warning system that is capable of detecting a missile launch. Its over-the-horizon and space-based capabilities should be easily capable of discerning the difference between an ICBM and a CPGS weapon. And while a greater proportion of its deterrent is land-based than that of the US (and clearly that of Britain or France), Russia maintains a significant second-strike capability with its SLBM force. Russia’s willingness to introduce nuclear weapons at a lower threshold than other powers is also clearly established. Therefore, a disarming strike by the US against the Russian ICBM force, or perhaps even its command and control structure, would seem highly risky, and therefore unlikely. Nonetheless, Russia’s sensitivity over their nuclear deterrent cannot be underestimated. The nuclear deterrent is seen as integral to Russia’s claim to be a great power. In addition to this, Russian policy makers are keenly aware of the inferiority of their conventional forces to the US, which acts to magnify both the symbolic and strategic value of nuclear weapons to the Kremlin. Any perceived threat, real or otherwise, will serve to create significant concerns in Moscow.

The perceived threat from these weapons is further amplified when CPGS is allied to missile defence systems. There are numerous statements by Russian and Chinese officials as to the combined effect of these conventional systems, and their capability of a disarming first strike. Such fears have driven Russia to increase its reliance on tactical nuclear weapons, and to upgrade the robustness of its nuclear systems, while also hastening aerospace defence capabilities. The reliance on tactical nuclear weapons in particular brings negative consequence in terms of security and control. They are widely held to highly destabilizing, and change the metrics of deterrence.

Further concerns are created by the ambiguities that are inherent in CPGS designs. These relate to the type of warhead, the country targeted, and the type of target. The points relating to the ambiguity of whether a weapon carried a nuclear or conventional warhead has been discussed above. The withdrawal of funding for the CTM has probably eradicated this as an uncertainty, at least as far as the US programme is concerned. Basing options and inspections would serve to eliminate the vestiges of any further doubt. However, the latter two concerns are more persistent. The ability of CPGS platforms to manoeuvre means that their destination cannot be determined until late in the flight envelope — perhaps not until the final moments. Thus a strike on a third party could be interpreted by Russia (and perhaps China in the future if it builds a missile warning system) as a strike on itself, and trigger a response. The likelihood of such a scenario is slim, but cannot be discounted entirely. Similarly, a state detecting an incoming strike (again, only Russia currently) may incorrectly assume that the strike is targeting its nuclear capabilities, rather than conventional forces. The fear would be that it would result in a serious escalation of tension, or even a nuclear retaliation. However, it is worth noting that the current costs of CPGS technologies would mean that such strikes would involve very limited number of weapons. Such numbers may not be considered sufficient for Russia to retaliate, though they might present a greater concern for China and its smaller nuclear force. Thus it is unlikely that a CPGS strike would be overwhelming. Once more, however, it may be perceptions that matter most. The cost and complexity of US CPGS systems make it hard to persuade Moscow or Beijing that they are designed for much less capable states, and there appears an assumption that ‘orthodox’ nuclear deterrence may be ineffective against conventional counterforce threats.

Thus there is concern that CPGS could have significant impact on the global nuclear order, and perhaps also nuclear proliferation. Even though the US ties these to nuclear reductions, the increased emphasis on conventional weaponry may do very little to allay security concerns in other states. In a scenario of decreased nuclear weapons numbers, conventional weapons will only increase in salience. The consequences could reduce the prospects for future nuclear reductions, and possibly increase tendencies towards proliferation.

Beyond the potential effects on escalation dynamics, questions remain as to how well these weapons would perform their mission. As CPGS rely on precision for their effect, an important consideration is exactly how precise such a weapon would be, given range and manoeuvring, particularly in environments where navigational signals are degraded or denied. Related to this, the timeliness of information is critical. How the requisite ISTAR assets can be brought to bear in non-permissive environments to provide this information, and indeed if they can, whether they wouldn’t be a more effective delivery platform themselves, are further issues that need resolving. Stealth platforms, or future armed reconnaissance Remotely Piloted Air Systems (RPAS) could be more effective in this role.[7]