### 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.

#### Ukraine has become a hub of innovation

John Sheldon, 10-25-2019, "Ukraine Passes Commercial Space Law Allowing Private Space Activities in 2020," SpaceWatch.Global, https://spacewatch.global/2019/11/ukraine-passes-commercial-space-law-allowing-private-space-activities-in-2020/]/ISEE

Once an integral and even iconic part of the Soviet, and then post-Cold War Russian, space programme, Ukraine’s space activities and fortunes have been in decline since 2014 when Russia annexed Ukrainian territory in the Crimea and the Donbas. This has resulted in crippling economic difficulties as well as the challenges of decoupling the Ukrainian space industry from Russian supply chains and overall economic orbit. The Ukrainian State Space Agency, along with Ukrainian space industry giant Yuzhnoye, has been a powerhouse in space and satellite launch capabilities over the years, though not always commercially successful as with the case of Sea Launch. The new Ukrainian commercial space law will allow private Ukrainian citizens and companies to commercially exploit and explore Earth orbit and beyond from Ukraine and under Ukrainian jurisdiction. A parallel aim, apparently, is to also reduce the role in the supervision of Ukrainian space activities by traditional state operators. Under the new law, private companies seeking to conduct commercial space activities in and from Ukraine will have to submit a declaration to government authorities. Commercial space activities that will involve rocket engine testing, satellite launch, and the control of satellites from Ukrainian territory will require a state permit. Shortly after President Zelensky signed the legislation into law, U.S. commercial satellite launch company Firefly Aerospace placed a U.S.$15 million order with Ukraine’s Yuzhmash rocket plant for the production of rocket parts. Firefly Aerospace is owned by Noosphere Ventures, founded by Dr. Max Polyakov who is a U.S. Citizen originally from Ukraine.

#### Yes link, the 1AC evidence admits that Ukrainian private space exploration companies are “international stars.” We read blue.

1AC Antonink 8/7 [(Daryna, studied journalism and communications at Taras Shevchenko National University in Kyiv. Antoniuk worked as a news editor, social media manager, and freelance journalist before she joined the Kyiv Post staff in February 2020.) “Ukraine’s space industry goes after private money” KyivPost, 8/7/2021. https://www.kyivpost.com/business/ukraines-space-industry-goes-after-private-money.html] BC

Lucrative industry

If space was once a political tool for world’s superpowers, today it is also a business opportunity for a new generation of entrepreneurs all over the world, including Ukraine.

Last year international private space companies attracted a record $9.1 billion to launch Earth monitoring or communications satellites into orbit or to build spacecraft that deliver people and cargo to space.

Investments in space are long-term and risky, Taftay said, but they pay off in the future.

“The space industry brings in seven times more money than it receives. For every dollar invested in the space industry, the country’s economy receives $6–7 in taxes and investment,” according to him.

As of today, Ukraine has 10 private space companies, Taftay said. Most of them — like Firefly Aerospace, Skyrora and Dragonfly — have become international stars and are now based in the U.S. or U.K., working with NASA and SpaceX.

But many Ukrainian space businesses export their products abroad because there is no money or work for them in Ukraine. “You can create your own space company here, but it is unclear what to do with it next. Who will be the customer?” Usov said.

In the U.S., nearly 80% of orders for space businesses come from the State Department or the Department of Defense, according to Usov. NASA astronauts even flew to the International Space Station on the Crew Dragon spacecraft manufactured by SpaceX.

For many decades Ukraine has only worked with state-owned enterprises like Pivdenmash and Pivdenne on its space projects. “This business model discouraged the development of new private companies,” Usov said.

To change this, the government passed a law in 2019 that allows private companies to build spacecraft in Ukraine and compete for contracts with state-owned enterprises or work together with them. In 2019, for example, Ukrainian-American aerospace company Firefly Aerospace ordered $15 million worth of missile parts from Ukrainian Pivdenmash.

But these agreements are rare. Ukraine’s main customer — the government — hasn’t yet signed any big contracts with private space companies. “There are no orders because we haven’t had financing or even a space program since 2018,” Taftay said.

$1 billion space program

Without a governmental space program, the Ukrainian space industry is frozen: “It hasn’t had any priorities, nor the conditions to develop,” said Oleg Uruskyi, the minister of strategic industries.

As a result, state-owned space enterprises have become less productive over the years. In 2018, state-owned space enterprises brought Ukraine $42 million in taxes, in 2019 — $34 million, in 2020 — $32 million. Last year was the most unfortunate for the Ukrainian space industry, according to Taftay.

Out of the country’s 15 state-owned space enterprises, five were loss-makers last year, four went bankrupt and one fired all of its employees. Together, they lost $30 million in 2020 compared to $16 million in 2019 and $2.7 million in 2018.

The space program submitted by Taftay will cost Ukraine over $1 billion — only half of this money will be covered by state funds, the other half — by export contracts.

Last year Ukrainian state-owned space companies produced $103 million worth of space-tech products and exported almost half of them — $64 million. Export usually takes up nearly 60–70% of the industry’s financing, according to Taftay.

Many European countries and the U.S. order Ukrainian-made rocket engines, navigation technology and rocket stages because they are cheap and reliable.

In the last 30 years, Ukrainian state-owned enterprises manufactured the components for 169 carrier rockets, including Cyclone, Zenith, Antares, Vega. These rockets launched 449 international spacecraft into orbit.

As of today, Ukraine only has two big international projects to rely on — the assembly of the first stage cores for NASA’s rocket Antares and the production of cruise propulsion engines for the European Space Agency’s rocket project Vega.

But they will not last forever, Usov said. Ukraine will need to secure more contracts with international partners but without a space program, it is impossible to do, according to Usov.

“Ukraine is still enjoying the perks it has gained in Soviet times — but it isn’t evolving. Other countries, in turn, invest in innovations and are catching up with Ukraine,” he said.

Future changes

To regain its power on the global market, Ukraine has to boost competition inside the country — between state-owned behemoths and private companies, according to Usov.

Today, the country’s space enterprises like Pivdenmash and Pivdenne in Dnipro, Kommunar and Hartron in Kharkiv or Kyivpribor in Kyiv cannot control their own assets or attract investment. They are also burdened by outdated infrastructure and a bloated workforce.

The giant Pivdenmash spaceship factory, which in the 20th century manufactured the most powerful rockets in the world, suffered $25 million losses in 2020. As the number of orders for its products has been decreasing, the factory descended into crisis: it didn’t have water for weeks, its sewage system didn’t work and employees weren’t paid properly.

To save state enterprises from the crisis, Ukraine plans to turn them into joint-stock companies, Taftay said. “It will make them more flexible and attractive for investors.”

Within the new space program, state enterprises will compete with private companies for the right to build six satellites — two each year starting in 2023, Taftay said. But first, Ukraine plans to send up the Sich 2–30 satellite in December using the U.S. launch vehicle Falcon 9 that belongs to SpaceX.

#### Plan bans this or can’t solve as per 1AC solvency explanations.

#### 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.

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

**Mallick and Rajagopalan, 19** (Senjuti Mallick is pursuing an L.L.M. in International Law at the Fletcher School of Law and Diplomacy, Graduate of ILS Law College and Rajeswari Rajagopalan is a Distinguished Fellow and Head of the Nuclear and Space Policy Initiative at the Observer Research Foundation, Technical Adviser to the UN Group of Governmental Experts on the Prevention of Arms Race in Outer Space, former Research Officer at the Institute of Defence Studies and Analyses and Professor at the Graduate Institute of International Politics at National Chung Hsing University, 1-24-2019, accessed on 10-17-2021, Observer Research Foundation, " If space is ‘the province of mankind’, who owns its resources ", https://www.orfonline.org/wp-content/uploads/2019/01/ORF\_Occasional\_Paper\_182\_Space\_Mining.pdf, HBisevac)

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 tech 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

#### Ukraine should ban the appropriation of outer space by private entities only if subject to a prior, binding, and genuine consultation that obtains free, prior, and informed consent from tribal nations.

#### Space is politically, culturally, and socioeconomically important to indigenous people, ensuring space security – BUT, free, prior, and informed consent through tribal consultation is necessary to recover indigenous connection to space and avoid unjust policy

Neilson and Cirkovic 21 [Hilding Neilson Elena Cirkovic Consulting Canadians on a Framework for Future Space Exploration Activities: A Response to the Canadian Space Agency (CSA) - Part I, Völkerrechtsblog, 28.07.2021, doi: 10.17176/20210728-135814-0.]/ISEE

We would like to start this two-part post with a reference to two very different and recent news articles from Canada: First, the positive: The Walrus article on First Nations astronomy in Canada. The second, is the news about a mass grave containing the remains of 215 children has been found in Canada at a former residential school set up to assimilate indigenous people. These two are related because they refer to indigenous peoples and their knowledge, and the attempts to erase that knowledge. This post is an expanded version of a response the authors wrote to the Canadian Space Agency (CSA) call for consultation with Canadians on Artemis Accords. In October 2020, Canada signed the US-led bilateral Artemis Accords, in order to establish a framework for future space exploration activities. The Accords provide a set of guidelines surrounding the Artemis Program for crewed exploration of the Moon. The project aims to return humans to the moon by 2024 and establish a crewed lunar base by 2030. Our objective is to look at this process from the perspective of Canadian constitutional rights of indigenous peoples, and the relevance of their knowledges for human activities in outer space. Part I focuses on the constitutional and treaty-based relationship between the government of Canada and indigenous peoples, and Part II will focus on the narratives of space exploration and the impact of satellite constellations. Canada’s position of support and leadership in space exploration has a positive and impressive history. From the development of the CanadaArm and the participation in work on the International Space Station (ISS) to the new scientific contributions with respect to lunar and Martian exploration, Canada has many reasons to be proud. However, it is worth noting that Canada’s role in space exploration has traditionally neglected to include Indigenous peoples, Indigenous knowledges, and Indigenous rights. In general, the history of Canadian participation in space exploration did not have a substantial and direct impact on Indigenous peoples’ rights in Canada. With accelerating technological developments in the past twenty years, space has become more accessible for humans. With these transformations, the current and proposed future of space exploration has the potential to negatively impact Indigenous peoples across Canada. One of the emerging issues for astronomers and various traditions including traditions of Indigenous peoples in Canada and elsewhere, is the launching of so-called satellite mega constellations, such as the SpaceX’s Starlink. Increasing the number of satellites in the Lower Earth’s Orbit (LEO), impacts further research. For various human cultures, Dark Skies have, among others, navigational and spiritual significance. Finally, the objective of our post is to emphasize the need for greater scientific understanding of the universe, which is achieved through research, education and outreach, and inclusion of multiple knowledges and ontologies. Without consultation with multiple knowledges of multicultural and multinational Canada, future space activities might contribute to the ongoing culture of colonization. We present arguments for the ethical and legal requirements for the CSA to consult with and to be inclusive of Indigenous rights and concerns as Canada moves to support the Artemis Accords. The Accords trigger a variety of issues in the outer space sector, which are beyond the scope of this brief post. The authors come to this work from two perspectives: the first being a Mi’kmaw astronomer who grew up in Newfoundland and is a status member of the Qalipu Nation, and co-author, a Bosnian-Canadian legal scholar. Thereby we stress that our contribution is an opinion and has no intent to speak for Indigenous peoples in general and/or any Indigenous-led organization in Canada, or any particular group or community in Canada. Please note that we will be using the terms Indigenous, and Aboriginal interchangeably as we engage with the language of domestic (Canadian) and international documents, publications, institutions, and relevant regulatory and/or administrative bodies. The terms Indigenous and Aboriginal refers to the three different categories of Indigenous peoples in Canada – First Nation, Inuit, and Métis. We reflect upon the CSA’s obligation to consult Indigenous peoples in Canada via two lenses: Firstly, where does Outer Space Law intersect with the modern and historic treaties between the First Nations and Canada (Crown)? Do these treaties include the skies and outer space? Secondly, considering its status as an international (and bilateral) agreement, where the Artemis Accords trigger the application of the United Nations Declaration on the Rights of Indigenous Peoples. Assuming that the Artemis Accords might, and in the situations where they do, trigger any responsibilities and obligations of Canada under the UNDRIP and its domestic laws to consult the First Nations, what are the CSA’s and Canada’s obligations to First Nation, Inuit, and Métis communities and Nations? We engage with these two points considering the following: That the questions of Indigenous rights and title in Canada, including the treaty rights, have significant impacts on how Canada consults with the First Nations and other communities and nations in Canada and pursues the ongoing and future space exploration accordingly; That these questions also require a revisiting of the allegedly prevailing narrative as proposed by some scholars and members of the global outer space sector, generally speaking, which treats space exploration as an analogy of the colonization of the Americas. The legal framework of our argument is that of Canadian Constitutional obligations towards indigenous peoples. The relevant cases are discussed and listed in the rest the following sections. Brief Consideration of Indigenous Rights in Canada Canada’s obligations to Indigenous peoples under the Canadian Constitution cannot be superseded or undermined by commitments under a bilateral agreement such as the Artemis Accords. These legal obligations include those recognized and affirmed by Section 35 of the Constitution Act, 1982, and those set out in self-government agreements. We recognize that, in 1985, the Supreme Court of Canada (SCC) concluded that treaties between Indigenous peoples and the Crown were not international treaties but were sui generis treaties (Simon v The Queen, [1985] 2 SCR 387 at para 33). However, it is worth considering that ‘[f]or many Indigenous peoples, treaties concluded with European powers…are, above all, treaties of peace and friendship, destined to organize coexistence in – not their exclusion from – the same territory and not to regulate restrictively their lives…under the overall jurisdiction of non-Indigenous authorities’ (para 117). While the United Nations, in documents including the UNDRIP, has recognized the potentially international character of Indigenous Crown treaties (UNDRIP Preamble, art 37(1)), we recognize that Canadian law has yet to consider this international recognition in domestic law. Nevertheless, as Henderson argues ‘any Crown authority over First Nations is limited to the actual scope of their treaty delegations. If no authority or power is delegated to the Crown, this power must be interpreted as reserved to First Nations, respectively, and is protected by prerogative rights and the common law since neither can extinguish a foreign legal system.’. There are plural and ongoing discussions on the status of Aboriginal title in Canada, as well as treaty obligations. It is beyond the scope of our comment to address the extensive international and domestic jurisprudence on the topic. However, we stress the existence of the Crown’s fiduciary duty to Aboriginal People as an aspect of various activities, including Canada’s activities in outer space (See, Annex I). Indeed, ‘The doctrine of Aboriginal rights exists… because of one simple fact: when Europeans arrived in North America, Aboriginal peoples were already here, living in communities on the land, and participating in distinctive cultures, as they had done for centuries. It is this fact, and this fact above all others, which separates Aboriginal peoples from all other minority groups in Canadian society and which mandates their special legal status.’ (Chief Justice Lamer in R. v. Van der Peet, para 30).

#### Ought means Should

Merriam Webster, No Date – Merriam Webster’s Learner’s Dictionary, “ought”, <http://www.learnersdictionary.com/definition/ought>  
ought /ˈɑːt/ verb  
Learner's definition of OUGHT [modal verb] 1 ◊ Ought is almost always followed by to and the infinitive form of a verb. The phrase ought to has the same meaning as should and is used in the same ways, but it is less common and somewhat more formal. The negative forms ought not and oughtn't are often used without a following to. — used to indicate what is expected They ought to be here by now. You ought to be able to read this book. There ought to be a gas station on the way. 2 — used to say or suggest what should be done You ought to get some rest. That leak ought to be fixed. You ought to do your homework.

#### Should = Certainty and Immediacy

Summers 94 (Justice – Oklahoma Supreme Court, “Kelsey v. Dollarsaver Food Warehouse of Durant”, 1994 OK 123, 11-8, http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker3fn13)

¶4 The legal question to be resolved by the court is whether the word "should"[13](http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker3fn13) in the May 18 order connotes futurity or may be deemed a ruling in praesenti.[14](http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker3fn14) The answer to this query is not to be divined from rules of grammar;[15](http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker3fn15) it must be governed by the age-old practice culture of legal professionals and its immemorial language usage. To determine if the omission (from the critical May 18 entry) of the turgid phrase, "and the same hereby is", (1) makes it an in futuro ruling - i.e., an expression of what the judge will or would do at a later stage - or (2) constitutes an in in praesenti resolution of a disputed law issue, the trial judge's intent must be garnered from the four corners of the entire record.[16](http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker3fn16) [CONTINUES – TO FOOTNOTE] [13](http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker2fn13) "*Should*" not only is used as a "present indicative" synonymous with *ought* but also is the past tense of "shall" with various shades of meaning not always easy to analyze. See 57 C.J. Shall § 9, Judgments § 121 (1932). O. JESPERSEN, GROWTH AND STRUCTURE OF THE ENGLISH LANGUAGE (1984); St. Louis & S.F.R. Co. v. Brown, 45 Okl. 143, 144 P. 1075, 1080-81 (1914). For a more detailed explanation, see the Partridge quotation infra note 15. Certain contexts mandate a construction of the term "should" as more than merely indicating preference or desirability. Brown, supra at 1080-81 (jury instructions stating that jurors "should" reduce the amount of damages in proportion to the amount of contributory negligence of the plaintiff was held to imply an *obligation* *and to be more than advisory*); Carrigan v. California Horse Racing Board, 60 Wash. App. 79, [802 P.2d 813](http://www.oscn.net/applications/oscn/deliverdocument.asp?box1=802&box2=P.2D&box3=813) (1990) (one of the Rules of Appellate Procedure requiring that a party "should devote a section of the brief to the request for the fee or expenses" was interpreted to mean that a party is under an *obligation* to include the requested segment); State v. Rack, 318 S.W.2d 211, 215 (Mo. 1958) ("should" would mean the same as "shall" or "must" when used in an instruction to the jury which tells the triers they "should disregard false testimony"). [14](http://www.oscn.net/applications/oscn/DeliverDocument.asp?CiteID=20287#marker2fn14) In praesenti means literally "at the present time." BLACK'S LAW DICTIONARY 792 (6th Ed. 1990). In legal parlance the phrase denotes that which in law is presently or immediately effective, as opposed to something that will or would become effective in the future *[in futurol*]. See Van Wyck v. Knevals, [106 U.S. 360](http://www.oscn.net/applications/oscn/deliverdocument.asp?box1=106&box2=U.S.&box3=360), 365, 1 S.Ct. 336, 337, 27 L.Ed. 201 (1882).

#### Consult counterplans are good for Neg Ground – Consult CPs are key to Neg ground where Space generics don’t spill-downward to specific countries or type of appropriation activity since there’s no scope of link. Consult CPs are the only way to generate stable generic contestation on an unlimited Aff topic. Neg Ground outweighs Aff Ground – key to Clash since Aff has infinite prep time to choose but we’re bound by the Aff’s choices – Clash makes every impact valuable since it’s distinct to debate.

## Case

### Solvency

#### Aff cant solve – companies will just go to other countries

Antonink 8/7 [(Daryna, studied journalism and communications at Taras Shevchenko National University in Kyiv. Antoniuk worked as a news editor, social media manager, and freelance journalist before she joined the Kyiv Post staff in February 2020.) “Ukraine’s space industry goes after private money” KyivPost, 8/7/2021. https://www.kyivpost.com/business/ukraines-space-industry-goes-after-private-money.html] BC

Lucrative industry

If space was once a political tool for world’s superpowers, today it is also a business opportunity for a new generation of entrepreneurs all over the world, including Ukraine.

Last year international private space companies attracted a record $9.1 billion to launch Earth monitoring or communications satellites into orbit or to build spacecraft that deliver people and cargo to space.

Investments in space are long-term and risky, Taftay said, but they pay off in the future.

“The space industry brings in seven times more money than it receives. For every dollar invested in the space industry, the country’s economy receives $6–7 in taxes and investment,” according to him.

As of today, Ukraine has 10 private space companies, Taftay said. Most of them — like Firefly Aerospace, Skyrora and Dragonfly — have become international stars and are now based in the U.S. or U.K., working with NASA and SpaceX.

But many Ukrainian space businesses export their products abroad because there is no money or work for them in Ukraine. “You can create your own space company here, but it is unclear what to do with it next. Who will be the customer?” Usov said.

In the U.S., nearly 80% of orders for space businesses come from the State Department or the Department of Defense, according to Usov. NASA astronauts even flew to the International Space Station on the Crew Dragon spacecraft manufactured by SpaceX.

For many decades Ukraine has only worked with state-owned enterprises like Pivdenmash and Pivdenne on its space projects. “This business model discouraged the development of new private companies,” Usov said.

To change this, the government passed a law in 2019 that allows private companies to build spacecraft in Ukraine and compete for contracts with state-owned enterprises or work together with them. In 2019, for example, Ukrainian-American aerospace company Firefly Aerospace ordered $15 million worth of missile parts from Ukrainian Pivdenmash.

But these agreements are rare. Ukraine’s main customer — the government — hasn’t yet signed any big contracts with private space companies. “There are no orders because we haven’t had financing or even a space program since 2018,” Taftay said.

$1 billion space program

Without a governmental space program, the Ukrainian space industry is frozen: “It hasn’t had any priorities, nor the conditions to develop,” said Oleg Uruskyi, the minister of strategic industries.

As a result, state-owned space enterprises have become less productive over the years. In 2018, state-owned space enterprises brought Ukraine $42 million in taxes, in 2019 — $34 million, in 2020 — $32 million. Last year was the most unfortunate for the Ukrainian space industry, according to Taftay.

Out of the country’s 15 state-owned space enterprises, five were loss-makers last year, four went bankrupt and one fired all of its employees. Together, they lost $30 million in 2020 compared to $16 million in 2019 and $2.7 million in 2018.

The space program submitted by Taftay will cost Ukraine over $1 billion — only half of this money will be covered by state funds, the other half — by export contracts.

Last year Ukrainian state-owned space companies produced $103 million worth of space-tech products and exported almost half of them — $64 million. Export usually takes up nearly 60–70% of the industry’s financing, according to Taftay.

Many European countries and the U.S. order Ukrainian-made rocket engines, navigation technology and rocket stages because they are cheap and reliable.

In the last 30 years, Ukrainian state-owned enterprises manufactured the components for 169 carrier rockets, including Cyclone, Zenith, Antares, Vega. These rockets launched 449 international spacecraft into orbit.

As of today, Ukraine only has two big international projects to rely on — the assembly of the first stage cores for NASA’s rocket Antares and the production of cruise propulsion engines for the European Space Agency’s rocket project Vega.

But they will not last forever, Usov said. Ukraine will need to secure more contracts with international partners but without a space program, it is impossible to do, according to Usov.

“Ukraine is still enjoying the perks it has gained in Soviet times — but it isn’t evolving. Other countries, in turn, invest in innovations and are catching up with Ukraine,” he said.

Future changes

To regain its power on the global market, Ukraine has to boost competition inside the country — between state-owned behemoths and private companies, according to Usov.

Today, the country’s space enterprises like Pivdenmash and Pivdenne in Dnipro, Kommunar and Hartron in Kharkiv or Kyivpribor in Kyiv cannot control their own assets or attract investment. They are also burdened by outdated infrastructure and a bloated workforce.

The giant Pivdenmash spaceship factory, which in the 20th century manufactured the most powerful rockets in the world, suffered $25 million losses in 2020. As the number of orders for its products has been decreasing, the factory descended into crisis: it didn’t have water for weeks, its sewage system didn’t work and employees weren’t paid properly.

To save state enterprises from the crisis, Ukraine plans to turn them into joint-stock companies, Taftay said. “It will make them more flexible and attractive for investors.”

Within the new space program, state enterprises will compete with private companies for the right to build six satellites — two each year starting in 2023, Taftay said. But first, Ukraine plans to send up the Sich 2–30 satellite in December using the U.S. launch vehicle Falcon 9 that belongs to SpaceX.

### AT: Scenario 1

#### They don’t solve - private entities can still invest in space even if the government is the one appropriating.

#### 1AC fuhrman admits development is due to “multiple factors,” it just lists Ukraine as one of them. If they are right about NoKo’s intentions, they will attempt to develop second strike at any cost.

#### No NoKo war

David C. **Kang &** Victor **Cha 18**. Kang is Maria Crutcher Professor of International Relations at the University of Southern California; Cha is Director for Asian Affairs in the White House's National Security Council, with responsibility for Japan, North and South Korea, Australia, and New Zealand. 2018. “Threatening, But Deterrence Works.” Nuclear North Korea, Columbia University Press, pp. 41–69. JSTOR, http://www.jstor.org/stable/10.7312/cha-18922.8.

This raises another question: does North Korea have legitimate security fears?

In a nutshell, the problem is this: the United States refuses to give security guarantees to North Korea until it proves it has dismantled its weapons program. The North refuses to disarm until it has security guarantees from the United States.

Hence, stalemate.

The key issue is whether North Korea has legitimate security concerns. If it does—and I will argue that this is the case—we can explain the pattern of North Korean behavior and also point to a solution. North Korea’s nuclear weapons, missile programs, and massive conventional military deployments are aimed at deterrence and defense. If North Korea really wanted to develop nuclear weapons for offensive purposes, it would have done so long ago. Even if the North develops nuclear weapons, it will not use them because of a devastating U.S. response. The North wants a guarantee of security from the U.S., and a policy of pressure will only make North Korea feel even more insecure. Even isolation is at best a holding measure, while economic sanctions—or even economic engagement alone—will be unlikely to get North Korea to abandon its weapons program.

Without movement toward resolving the security fears of the North, progress in resolving the nuclear weapons issue will be limited. The United States and North Korea are still technically at war—the 1953 armistice was never replaced with a peace treaty. The U.S. has been unwilling to discuss even a nonaggression pact, much less a peace treaty or normalization of ties. With the U.S. calling North Korea a terrorist nation and Donald Rumsfeld discussing the possibility of war, it is no surprise that North Korea feels threatened. Upon closer examination, North Korea never had the material capabilities to be a serious contender to the U.S.- ROK alliance, and it quickly fell further behind. So the real question has not been whether North Korea would prevent or preempt as South Korea caught up, but instead why North Korea might fight as it fell farther and farther behind. To paraphrase William Wohlforth, “theorists tended to concentrate on dynamic challengers and moribund defenders. But in Korea the North was the moribund challenger, and the South was the rising defender.”7

If North Korea was so weak, why did so many people conclude that North Korea was the likely instigator of war? Since North Korea was not powerful, scholars and policymakers hypothesized extreme psychological tendencies to North Korean leaders. That is, if the material conditions such as military or economic power did not lead logically to a conclusion of North Korean threat, then the leadership’s psychology was what must matter. These ancillary and ad hoc psychological assumptions range from an irrational North Korean leadership to an extremely strong preference for invasion. Most theories of war focus on material conditions such as relative power, but in the case of North Korea, the real analytic lifting has been done by psychological assumptions about intent. As I will show, none of these assumptions are tenable.8

The explanation for a half-century of stability and peace on the Korean peninsula is actually quite simple: deterrence works. Since 1953 North Korea has faced both a determined South Korean military, and more importantly, U.S. military deployments that at their height comprised 100,000 troops and more than 100 nuclear-tipped Lance missiles aimed at North Korea. Even today the United States maintains bases in South Korea that include 38,000 troops, nuclear-capable airbases, and naval facilities that guarantee U.S. involvement in any conflict on the peninsula. While in 1950 there might have been reason for confidence in the North, the war was disastrous for the Communists, and without massive Chinese involvement North Korea would have ceased to exist. Even during the cold war, North Korea’s leadership never challenged this deterrence on the peninsula. As I will show, the attempted assassinations of South Korea’s authoritarian leaders during the 1970s and 1980s have stopped because they would be clearly counterproductive in a democratic South Korea, and will not begin again. Given the tension on the peninsula, small skirmishes have had the potential to spiral out of control, yet these incidents on the peninsula have been managed with care on both sides. The peninsula has been stable for fifty years because deterrence has been clear and unambiguous.

The end of the cold war marked a major change in North Korea’s security position. The past fifteen years have seen the balance of power turn sharply against the North. What was stable deterrence during the cold war by both sides has swung quickly in favor of the West and South Korea.19 In the 1990s North Korea lost its two cold war patrons, experienced economic and environmental crises, and fell far behind the South. Although during the cold war the North was the aggressor, this shift in power put it on the defensive. It was only when the balance began to turn against the North that it began to pursue a nuclear weapons program. Both the weapons program and the bellicose nature of its rhetoric are an attempt to continue to deter the U.S. from taking any preemptive moves against it.

North Korea has the worst public relations in the world. The North’s anachronistic cold war rhetoric and seeming inability to present itself reasonably make it difficult for even impartial people in the West to make sense of its actions. This chapter is aimed at providing an explanation. As history has shown, pressure only exacerbates North Korean security fears. Since North Korea does not pose the threat many analysts think it does, the United States may be wasting resources aimed at the North, and may also be unnecessarily raising tensions throughout the region.

I want to emphasize that I am neither defending nor justifying North Korean behavior. Much of the regime’s actions are abhorrent and morally indefensible. However, sound foreign policy is built upon clear and objective analysis of the conditions at hand. Emotion and ideology have often interfered with the reasoned study of North Korea, and this has led scholars and policymakers to consistently overestimate the North Korean threat and to misunderstand the motivations behind North Korea’s actions.

This chapter is focused on explaining the pattern of North Korea’s military and security policies. A complete picture of North Korea must also include the dramatic steps taken in the past decade to reform and open up its economy. In chapter 4 I will discuss North Korea’s economy and what it tells us about their foreign policy. In this chapter I perform four tasks. First, I show why North Korea is not a threat. Second, I explain why deterrence has worked for fifty years, and show that the changing balance of power has increased North Korea’s security fears. Third, I show why, even if North Korea develops a nuclear weapons capability, it will not use them, and also why North Korea is unlikely to engage in terrorism. Finally, I examine the “madman hypothesis” to show how questionable assumptions can be smuggled into the analysis of North Korea, and show why assuming irrationality is unproductive.

WHY NORTH KOREA IS NOT A MILITARY THREAT

In explaining North Korea’s foreign policy, a useful place to begin is by exploring why North Korea has become weaker and what has deterred it from starting a war. North Korea chose not to attack the South during the cold war, even though it was at the height of its power and was supported by the PRC and the Soviet Union. The past fifteen years have led to severe economic and military decline in North Korea, and it is now much weaker than South Korea. Intuitively, it follows that this nation is fearful of the United States.

The majority of international relations theories conclude that the source of threats is clear: power is threatening. Kenneth Waltz writes that “balance of power theory leads one to expect that states, if they are free to do so, will flock to the weaker side. The stronger, not the weaker side, threatens them. . . . Even if the powerful state’s intentions are wholly benign, less powerful states will . . . interpret events differently.”10 Because states are concerned primarily with their own survival, and since states are concerned about relative power, there always exists the possibility that a strong nation may decide to begin hostilities with a weaker nation. Viewed differently, “parity preserves peace.”11 Thus a potential aggressor will not initiate a conflict if it cannot win.

Threats arise by the mere presence of capabilities. Even if a nation was peaceful when it was weak, changes in power can bring changes in goals. Robert Gilpin writes that “rising power leads to increasing ambition. Rising powers seek to enhance their security by increasing their capabilities and their control over the external environment.”12 In this sense intentions are not fixed, but instead flow from and respond to changes in capabilities. The obverse of Gilpin’s argument is that as a nation’s capabilities fall behind, as it grows relatively weaker, its fears about the external environment will increase. Its ambitions will lessen, and its perception of external threat will rise. A preventive war might occur if the challenger’s economic and military capabilities begin to catch those of the defender. In that case, there exists the possibility that the defender will decide to fight a preventive war to keep the challenger from catching up, or that the challenger will fight after it catches up.13

However, there are two generic problems in applying the theories to the Korean peninsula. First, the theories predict peace if a small challenger falls farther behind the defender.14 If a nation was deterred from attacking when it was 60 percent the size of the defender, why would it attack after it has fallen to 30 percent, or even less, of the defender’s size? There are only two logical ways in which one can end up with the weaker power attacking the stronger. The first argument is well elucidated by Victor Cha in chapter 1, which I will discuss that at length in chapter 4. The [[GRAPH 2.1 OMITTED]] second way is to assume that the leader is irrational.15 I will show below why the madman theory does not make much sense.

Before that, however, I will show how absolutely weak the North actually is. The first calculation compares only North and South Korea, while the second calculation includes likely U.S. actions in these assessments. The typical approach has been to take both North and South Korea and compare them along a range of economic and military measures, and I will show that North Korea’s capabilities were never preeminent over the South. More important, however, is an assessment of relative power that includes the U.S. forces that would be involved on the peninsula in event of a conflict. Scholars rarely consider this balance of forces, but this is a mistake, because any war would certainly involve the United States. Both of these measures show clearly that preventive war and power transition theories are not applicable to the Korean case.

[[GRAPH 2.2 OMITTED]]

South Korea has always had twice the population of the North. In economic terms, North Korea was never as large as the South, and even at its closest was no more than three-quarters the size of the South. Graph 2.1 shows estimates for the gross national product (GNP) of North and South Korea from 1953 to 2000. It is clear that North Korea was never close to the South in absolute size, and indeed after 1960 rapidly began falling farther and farther behind. North Korea’s GNP in 1960 was $1.52 billion, while South Korea’s GNP was $1.95 billion. By 1970 North Korea had grown to $3.98 billion, while in the South GNP was $7.99 billion.

On a per capita income basis the North was never much farther ahead of the South, either. The North and South were roughly equivalent until the mid-1970s, when the South began to rapidly leave the North behind (graph 2.2). In 1960 North Korea’s per capita GNP was $137 as compared to $94 in the South, and in 1970 the North’s per capita income was $286 to $248 in the South. [[GRAPH 2.3 OMITTED]] However, by 1980 the North’s income was $758 per capita, while the South’s was $1,589, and by 1990 $1,065 to $5,569. Furthermore, in terms of preventive war, per capita income is not as important as absolute size, because small nations may be rich on a per capita basis (Singapore, Switzerland) but be militarily insignificant.

In terms of defense spending, North Korea quickly fell behind the South, spending less on defense by the mid-1970s (graph 2.3). As far back as 1977 the South was spending more than the North on defense in absolute dollar terms, $1.8 billion in the South opposed to $1 billion by the North.16 The only measure by which the North outspent the South was on a per-capita GNP basis, which is an indicator of weakness, not strength.17 Additionally these numbers do not include military transfers from their respective patrons. Between 1965 and 1982 North Korea received $1.5 billion in military transfers, mostly from the Soviet Union. Over the same time period South Korea received $5.1 billion from the United States.18

[[GRAPH 2.4 OMITTED]]

Thus the most common measures of power in international relations—economic size and defense spending—show quite clearly that North Korea was never larger than South Korea, has been smaller on an absolute and per-capita basis than the South for at least thirty years, and continues to fall farther behind. Those who see North Korea as threatening need to explain why North Korea— having waited fifty years—would finally attack now that it is one-twentieth the size of the South.

In military capabilities the North and South Korea were in rough parity for the first two decades following the Korean War (1950–1953), and then the North began to fall behind. Graph 2.4 shows the number of men in the armed forces from 1963 to 1998. Most interesting is that North Korea did not begin its massive expansion of its armed forces until well into the 1970s. This is most probably a response to its falling further behind the South. But for the past thirty years, North Korea’s training, equipment, and overall military quality has steadily deteriorated relative to the South.

The South Korean military is better-equipped, better-trained, and more versatile with better logistics and support than the North Korean military, and some assessments suggest that this may double combat effectiveness.19 Although the military has continued to hold pride of place in the North Korean economy, there have been increasing reports of reduced training due to the economic problems. Joong-Ang Ilbo, one of South Korea’s major daily newspapers, quoted an unidentified Defense Ministry official as saying that North Korea’s air force had made one hundred training sorties per day in 1996, down from three hundred to four hundred before the end of 1995, and that the training maneuvers of ground troops had also been reduced to a “minimum level.”20 American military officials have noted that individual North Korean pilots take one training flight per month, compared with the ten flights per month that U.S. pilots take.21 This drastically degrades combat readiness.

Table 2.1 shows a comparison of weaponry in North and South Korea in 1997. The bulk of North Korea’s main battle tanks are of 1950s vintage, and most of its combat aircraft were introduced before 1956. Evaluations after the Gulf War concluded that Western weaponry is at least twice, or even four-times, better than older Soviet-vintage systems.22 By the 1990s North Korea’s military was large in absolute numbers but the quality of their forces was severely degraded relative to South Korea’s and the U.S. military. Michael O’Hanlon notes that: “Given the obsolescence of most North Korean equipment, however, actual capabilities of most forces would be notably less than raw numbers suggest. About half of North Korea’s major weapons are of roughly 1960s design; the other half are even older.”23

To view the North as superior in military terms is a mistake. But even more surprising about many of these accounts is that they measure the strength of the North Korean military only against that of the ROK, without including the U.S. forces, either present in Korea or those potential reinforcements. North Korea knows that it would fight the United States as well as the South, and it is wishful thinking to hope that the North Korean military [[TABLE 2.1 OMITTED]] planners are so naïve as to ignore the U.S. military presence in South Korea, expecting the U.S. to pack up and go home if the North invaded. Comparisons between the South and the North that ignore the role of the United States are seriously misleading as to the real balance of power on the peninsula.24

In event of a full-scale conflict, the United States could reinforce the peninsula with overwhelming power. Currently 36,000 U.S. troops are stationed in Korea, including the U.S. Second Infantry Division and 90 combat aircraft including 72 F-16s. In addition, 36,000 troops are stationed in Japan, including the headquarters of the Seventh fleet at Yokosuka naval base, 14,000 Marines, and 90 combat aircraft. This is only the beginning, as more would soon arrive from within the United States.25

This economic and military comparison of North and South Korea shows that North Korea never had a lead over the South, and after the 1960s quickly began falling behind. The end of the cold war marked the beginning of a major change in North Korea’s fortunes, as North Korea continued to have economic difficulties, while its allies deserted it. This situation has only become more grave in the new millennium.

North Korea is not a threat to start an unprovoked war. North Korea was never in a preeminent position relative to the South, and the real question for the pessimists is why they continue to believe that a nation that is far behind and falling farther behind might still attack. The weak may attack the strong—but the conditions under which we expect that to happen do not exist on the peninsula. Yet many people still see the situation as tense and threatening. This is true, but it is true because deterrence at its heart requires both sides to know that the other side can severely damage it.

DETERRENCE AND THE CHANGING BALANCE OF POWER

North Korea has not attacked for fifty years because deterrence works. Despite the tension that has existed on the peninsula, the balance of power has held. For more than fifty years neither side has attempted to mount a major military operation, nor has either side attempted to challenge deterrence on the peninsula.26 Any war on the peninsula would have disastrous consequences for both sides. The tightly constricted geographic situation intensifies an already acute security dilemma between the two sides.27 The capitals of Seoul and Pyongyang are less than 150 miles apart—closer than New York and Baltimore. Seoul is 30 miles from the de-militarized zone that separates the North and the South (DMZ), and easily within reach of North Korea’s artillery tubes. One estimate calculates that a war on the Korean peninsula would cost the United States more than $60 billion and result in 3 million casualties, including 52,000 U.S. military casualties. The North, although it has numerically larger armed forces, faces a much more highly trained and capable U.S.-ROK armed forces. This led to stalemate: there was little room for barter or bargaining. The result has not been surprising: although tension is high, the balance of power has been stable. Far from being a tinderbox, both sides have moved cautiously and avoided major military mobilizations that could spiral out of control.

#### War’s inevitable—a first strike now achieves successful denuclearization—waiting causes Kim to EMP the grid and sell nukes to Iran.

Pry, 19 — Dr. Peter Vincent Pry; Chief of staff of the congressional Electromagnetic Pulse Commission, served on the House Armed Services Committee and the CIA. Executive Director of the Task Force on National and Homeland Security and Director of the U.S. Nuclear Strategy Forum. (3-26-2019; "Military options for denuclearizing North Korea;" *Washington Times*; https://www.washingtontimes.com/news/2019/mar/26/military-options-for-denuclearizing-north-korea/; //GrRv)

After North Korea’s H-Bomb test in September 2017, some analysts, myself included, urged the White House to consider possible military options, using conventional surgical strikes to denuclearize North Korea quickly, while minimizing escalatory risks. Decades of failed talks, and the failed Hanoi nuclear summit proves again, North Korea will not denuclearize peacefully. Dictator Kim Jong-un’s game is to buy time through pretend negotiations to build enough ICBMs so nuclear-armed North Korea, with a Mutual Assured Destruction (MAD) relationship with the United States, becomes irreversible. Economic sanctions designed to pressure North Korea’s denuclearization peacefully never worked, and are not working now. According to a recent United Nations report obtained by the Associated Press, leaked in the UK Guardian (March 11, 2019): “United Nations experts are investigating possible violations of UN sanctions on North Korea in about 20 countries, from alleged clandestine nuclear procurement in China to arms brokering in Syria and military cooperation with Iran, Libya and Sudan. The expert panel’s 66-page report to the security council also detailed the appearance in North Korea of a Rolls-Royce Phantom, Mercedes-Benz limousines and Lexus LX 570 all-wheel-drives in violation of a ban on luxury goods. And it noted a trend in North Korea’s evasion of financial sanctions by using cyberattacks to ‘illegally force the transfer of funds from financial institutions and cryptocurrency exchanges.’” Moreover, according to the UN report: “North Korea’s nuclear and missile programs remained intact and its leaders were dispersing missile assembly and testing facilities to prevent ‘decapitation’ strikes.” The White House should be alarmed North Korea is now reneging on dismantlement of their Sohae satellite launch facility, rebuilding Sohae to orbit satellites, possibly nuclear-armed for EMP attack. The Congressional EMP Commission warns two North Korean satellites presently orbit over the United States that, if nuclear-armed, could blackout North America — posing potentially the single greatest nuclear threat from North Korea. The EMP Commission recommends shooting-down these satellites over uninhabited regions. The United States has intercepted satellites before, in the 1980s, and is significantly more capable of anti-satellite operations today. Destruction of North Korea’s two satellites would be the least escalatory military option, as it would not entail striking North Korea’s homeland, yet would eliminate the greatest potential nuclear threat to the United States. Downing North Korea’s satellites alone, one of the smallest and most easily executed military operations, might be enough to bring about a diplomatic solution. For the first time the United States will be striking against the North Korean nuclear threat — proving to Pyongyang, China, and Russia the United States is determined to denuclearize North Korea, forcefully if necessary. Another military option, more ambitious and riskier, would destroy North Korea’s: 2 satellites, 12-20 ICBMs, 30-50 IRBMs, 60 mostly non-nuclear bombers, 1 Sinpo missile submarine, 12 retired Golf missile submarines (purchased from Russia), the Sohae satellite launcher and Yongbyon Nuclear Complex, including a nearby clandestine uranium enrichment facility. Tunnels can become graveyards for North Korean missiles by bombing entrances. North Korean air defenses are antiquated, ineffective, and can be suppressed non-lethally with electronic countermeasures. Aegis cruisers and other anti-missile defenses can be surged to intercept any launched missiles. All of this, fewer than 150 targets, could probably be destroyed by three aircraft carriers and Global Strike forces using conventional weapons in a few hours. Any surviving or future new ICBMs or IRBMs should be destroyed on sight. This campaign would eliminate the North Korean nuclear missile threat to North America and U.S. territories and severely ~~cripple~~ their nuclear program. Another military option, even more ambitious and even riskier, would do all the above and destroy North Korea’s almost entirely non-nuclear 300-450 MRBMs and 600-800 SRBMs. This would eliminate Pyongyang’s nuclear threat to Japan and South Korea, but would probably require days to execute and entail much higher escalatory risks. Striking quickly, surgically, against the smallest number of targets, is least likely to be misconstrued as attempting to destroy the North Korean regime in an all-out war — and therefore least likely to result in North Korean escalation using nuclear or other weapons of mass destruction. ~~Psychopaths~~ [Dictators] like Kim Jong-un have been attacked, and defeated, without their using weapons of mass destruction (WMDs): • Adolf Hitler during World War II refrained from using Tabun and Sarin nerve gas, fearing Allied retaliation. • Iraq’s Saddam Hussein did not retaliate for Israel’s destruction of his Osirik nuclear reactor in 1981, or launch chemical and biological missiles during wars with the United States in 1991 and 2003. • Syria’s Bashar Assad did not retaliate for Israel’s destruction of his clandestine Al Kibir nuclear reactor in 2007, or for U.S. destruction of his Barzah chemical-biological weapons complex in 2018. Denuclearizing North Korea forcibly is very risky. The United States should be prepared to respond to North Korean use of WMDs — including with nuclear strikes to destroy the regime, if necessary. But “living” with nuclear-armed North Korea, surrendering to Mutual Assured Destruction with Kim Jong-un, is reckless and will surely kill millions. If North Korea defies denuclearization successfully, nuclear-armed Iran is next. Tehran on March 18 announced Russia will build them two more nuclear reactors.

#### Iran prolif causes nuclear war.

Kroenig & McNally, 13 — Matthew Kroenig is an assistant professor and international relations field chair in the department of government at Georgetown University, author of Exporting the Bomb: Technology Transfer and the Spread of Nuclear Weapons, and served, from 2010–11, as an adviser on Iran policy in the Office of the Secretary of Defense. Robert McNally is president of the Rapidan Group, an energy market and policy consulting firm, and served as Special Assistant to the President at the U.S. National Economic Council and Senior Director for International Energy at the U.S. National Security Council under President George W. Bush. (2-12-2013; “Iranian Nukes and Global Oil;” *America in the World*; <http://matthewkroenig.com/Kroenig_Iranian%20Nukes%20and%20Global%20Oil.pdf>; //GrRv)

If Iran had nuclear weapons, however, U.S. military options would be constrained by inverted deterrence. U.S. threats to use force to reopen the Strait could be countered by Iranian threats to use devastatingly deadly force against U.S. allies, bases or forces in the region. Such threats might not be entirely credible since the U.S. military would control any imaginable escalation ladder up to and including the nuclear threshold, but they wouldn’t be entirely incredible, either, given the risk of accident or inadvertent nuclear use in a high-stakes crisis. If, further, Iran develops ballistic missiles capable of reaching the United States—and the annual report of the U.S. Department of Defense estimates this could happen as soon as 2015—Iran could also threaten nuclear strikes against the U.S. homeland in retaliation for the use of conventional forces in the region. Any U.S. President would have to think long and hard about using force against Iran if it entailed a risk of nuclear war, even a nuclear war that the United States would win. Most worrisome, an unstable, poly-nuclear Middle East will mean that nuclear weapons will be ever-present factors in most, if not all, future regional conflicts. As President Obama noted in the remarks excerpted above, if Iran acquires nuclear weapons, Saudi Arabia, Turkey, Egypt and other states might follow suit. Nuclear weapons in these states would further complicate the nuclear balance in the region and potentially extend the boundaries of any nuclear exchange. Even if Iran’s leaders are less reckless and ~~suicidal~~ than their rhetoric would suggest, international politics, crises and miscalculation do not end when countries acquire nuclear weapons. Nuclear powers still challenge nuclear-armed adversaries. As the early decades of the Cold War remind us, nuclear-armed states do sometimes resort to nuclear brinkmanship that can lead to high-stakes nuclear standoffs. We were lucky to survive the Cold War without suffering a massive nuclear exchange; President Kennedy estimated that the probability of nuclear war in the Cuban Missile Crisis alone was as high as 50 percent.14 The reference to the early days of the Cold War is not merely decorative here. What made the Cuban Missile Crisis so dangerous is that nearly all of the conditions that helped us avoid nuclear war during the latter half of the Cold War are absent from the Iran-Israel-U.S. nuclear balance. Then, there were only two players, both with secure, second-strike capabilities and strategic depth; relatively long flight times for ballistic missiles between states, enabling all sides to eschew launch-on-warning postures; clear lines of communication between capitals; and more. In a high-stakes nuclear crisis with Iran and its adversaries, there is a real risk that things could spiral out of control and result in nuclear war

#### EMPs causes extinction

Friedemann, 16 — Alice Friedemann; transportation expert, founder of EnergySkeptic.com and author of “When Trucks Stop Running, Energy and the Future of Transportation,” worked at American Presidential Lines for 22 years, where she developed computer systems to coordinate the transit of cargo between ships, rail, trucks, and consumers, citing Dr. Peter Vincent Pry. Pry is executive director of the Task Force on National and Homeland Security, a Congressional advisory board dedicated to achieving protection of the United States from electromagnetic pulse and other threats. Dr. Pry is also the director of the United States Nuclear Strategy Forum, an advisory body to Congress on policies to counter weapons of mass destruction. Dr. Pry has served on the staffs of the Congressional Commission on the Strategic Posture of the United States, the Commission to Assess the Threat to the U.S. from an EMP Attack, the House Armed Services Committee, as an intelligence officer with the CIA, and as a verification analyst at the U.S. Arms Control and Disarmament Agency. (1-24-16, “Electromagnetic pulse threat to infrastructure (U.S. House hearings)” http://energyskeptic.com/2016/the-scariest-u-s-house-session-ever-electromagnetic-pulse-and-the-fall-of-civilization/)

Modern civilization cannot exist for a protracted period without electricity. Within days of a blackout across the U.S., a blackout that could encompass the entire planet, emergency generators would run out of fuel, telecommunications would cease as would transportation due to gridlock, and eventually no fuel. Cities would have no running water and soon, within a few days, exhaust their food supplies. Police, Fire, Emergency Services and hospitals cannot long operate in a blackout. Government and Industry also need electricity in order to operate. The EMP Commission warns that a natural or nuclear EMP event, given current unpreparedness, would likely result in societal collapse. Terrorists, criminals, and even lone individuals can build a non-nuclear EMP weapon without great trouble or expense, working from Unclassified designs publicly available on the internet, and using parts available at any electronics store. In 2000, the Terrorism Panel of the House Armed Services Committee sponsored an experiment, recruiting a small team of amateur electronics enthusiasts to attempt constructing a radiofrequency weapon, relying only on unclassified design information and parts purchased from Radio Shack. The team, in 1 year, built two radiofrequency weapons of radically different designs. One was designed to fit inside the shipping crate for a Xerox machine, so it could be delivered to the Pentagon mail room where (in those more unguarded days before 9/11) it could slowly fry the Pentagon’s computers. The other radiofrequency weapon was designed to fit inside a small Volkswagon bus, so it could be driven down Wall Street and disrupt computers— and perhaps the National economy. Both designs were demonstrated and tested successfully during a special Congressional hearing for this purpose at the U.S. Army’s Aberdeen Proving Ground. Radiofrequency weapons are not merely a hypothetical threat. Terrorists, criminals, and disgruntled individuals have used home-made radiofrequency weapons. The U.S. military and foreign militaries have a wide variety of such weaponry. Moreover, non-nuclear EMP devices that could be used as radiofrequency weapons are publicly marketed for sale to anyone, usually advertised as ‘‘EMP simulators.’’ For example, one such simulator is advertised for public sale as an ‘‘EMP Suitcase.’’ This EMP simulator is designed to look like a suitcase, can be carried and operated by one person, and is purpose-built with a high energy radiofrequency output to destroy electronics. However, it has only a short radius of effect. Nonetheless, a terrorist or deranged individual who knows what he is doing, who has studied the electric grid for a major metropolitan area, could—armed with the ‘‘EMP Suitcase’’— black out a major city. A CLEAR AND PRESENT DANGER. An EMP weapon can be used by state actors who wish to level the battlefield by neutralizing the great technological advantage enjoyed by U.S. military forces. EMP is also the ideal means, the only means, whereby rogue states or terrorists could use a single nuclear weapon to destroy the United States and prevail in the War on Terrorism or some other conflict with a single blow. The EMP Commission also warned that states or terrorists could exploit U.S. vulnerability to EMP attack for coercion or blackmail: ‘‘Therefore, terrorists or state actors that possess relatively unsophisticated missiles armed with nuclear weapons may well calculate that, instead of destroying a city or military base, they may obtain the greatest political-military utility from one or a few such weapons by using them—or threatening their use—in an EMP attack.’’ The EMP Commission found that states such as Russia, China, North Korea, and Iran have incorporated EMP attack into their military doctrines, and openly describe making EMP attacks against the United States. Indeed, the EMP Commission was established by Congress partly in response to a Russian nuclear EMP threat made to an official Congressional Delegation on May 2, 1999, in the midst of the Balkans crisis. Vladimir Lukin, head of the Russian delegation and a former Ambassador to the United States, warned: ‘‘Hypothetically, if Russia really wanted to hurt the United States in retaliation for NATO’s bombing of Yugoslavia, Russia could fire an SLBM and detonate a single nuclear warhead at high altitude over the United States. The resulting EMP would massively disrupt U.S. communications and computer systems, shutting down everything.’’ China’s military doctrine also openly describes EMP attack as the ultimate asymmetric weapon, as it strikes at the very technology that is the basis of U.S. power. Where EMP is concerned, ‘‘The United States is more vulnerable to attacks than any other country in the world’’: ‘‘Some people might think that things similar to the ‘Pearl Harbor Incident’ are unlikely to take place during the information age. Yet it could be regarded as the ‘Pearl Harbor Incident’ of the 21st Century if a surprise attack is conducted against the enemy’s crucial information systems of command, control, and communications by such means as… electromagnetic pulse weapons… Even a superpower like the United States, which possesses nuclear missiles and powerful armed forces, cannot guarantee its immunity…In their own words, a highly computerized open society like the United States is extremely vulnerable to electronic attacks from all sides. This is because the U.S. economy, from banks to telephone systems and from power plants to iron and steel works, relies entirely on computer networks… When a country grows increasingly powerful economically and technologically…it will become increasingly dependent on modern information systems… The United States is more vulnerable to attacks than any other country in the world.’’ Iran—the world’s leading sponsor of international terrorism—in military writings openly describes EMP as a terrorist weapon, and as the ultimate weapon for prevailing over the West: ‘‘If the world’s industrial countries fail to devise effective ways to defend themselves against dangerous electronic assaults, then they will disintegrate within a few years… American soldiers would not be able to find food to eat nor would they be able to fire a single shot.’’ The threats are not merely words. The EMP Commission assesses that Russia has, as it openly declares in military writings, probably developed what Russia describes as a ‘‘Super-EMP’’ nuclear weapon—specifically designed to generate extraordinarily high EMP fields in order to paralyze even the best protected U.S. strategic and military forces. China probably also has Super-EMP weapons. North Korea too may possess or be developing a Super-EMP nuclear weapon, as alleged by credible Russian sources to the EMP Commission, and by open-source reporting from South Korean military intelligence. But any nuclear weapon, even a low-yield first generation device, could suffice to make a catastrophic EMP attack on the United States. Iran, although it is assessed as not yet having the bomb, is actively testing missile delivery systems and has practiced launches of its best missile, the Shahab–III, fuzing for high- altitude detonations, in exercises that look suspiciously like training for making EMP attacks. As noted earlier, Iran has also practiced launching from a ship a Scud, the world’s most common missile—possessed by over 60 nations, terrorist groups, and private collectors. A Scud might be the ideal choice for a ship-launched EMP attack against the United States intended to be executed anonymously, to escape any last-gasp U.S. retaliation. Unlike a nuclear weapon detonated in a city, a high-altitude EMP attack leaves no bomb debris for forensic analysis, no perpetrator ‘‘fingerprints.’’ Under present levels of preparedness, communications would be severely limited, restricted mainly to those few military communications networks that are hardened against EMP. Today’s microelectronics are the foundation of our modern civilization, but are over 1 million times more vulnerable to EMP than the far more primitive and robust electronics of the 1960s, that proved vulnerable during nuclear EMP tests of that era. Tests conducted by the EMP Commission confirmed empirically the theory that, as modern microelectronics become ever smaller and more efficient, and operate ever faster on lower voltages, they also become ever more vulnerable, and can be destroyed or disrupted by much lower EMP field strengths. Microelectronics and electronic systems are everywhere, and run virtually everything in the modern world. All of the civilian critical infrastructures that sustain the economy of the United States, and the lives of 310 million Americans, depend, directly or indirectly, upon electricity and electronic systems. Of special concern is the vulnerability to EMP of the Extra-High-Voltage (EHV) transformers, that are indispensable to the operation of the electric grid. EHV transformers drive electric current over long distances, from the point of generation to consumers (from the Niagara Falls hydroelectric facility to New York City, for example). The electric grid cannot operate without EHV transformers—which could be destroyed by an EMP event. The United States no longer manufactures EHV transformers. They must be manufactured and imported from overseas, from Germany or South Korea, the only two nations in the world that manufacture such transformers for export. Each EHV transformer must be custom-made for its unique role in the grid. A single EHV transformer typically requires 18 months to manufacture. The loss of large numbers of EHV transformers to an EMP event would plunge the United States into a protracted blackout lasting years, with perhaps no hope of eventual recovery, as the society and population probably could not survive for even 1 year without electricity. Another key vulnerability to EMP are Supervisory Control And Data Acquisition systems (SCADAs). SCADAs essentially are small computers, numbering in the millions and ubiquitous everywhere in the critical infrastructures, that perform jobs previously performed by hundreds of thousands of human technicians during the 1960s and before, in the era prior to the microelectronics revolution. SCADAs do things like regulating the flow of electricity into a transformer, controlling the flow of gas through a pipeline, or running traffic control lights. SCADAs enable a few dozen people to run the critical infrastructures for an entire city, whereas previously hundreds or even thousands of technicians were necessary. Unfortunately, SCADAs are especially vulnerable to EMP. EHV transformers and SCADAs are the most important vulnerabilities to EMP, but are by no means the only vulnerabilities. Each of the critical infrastructures has their own unique vulnerabilities to EMP: The National electric grid, with its transformers and generators and electronic controls and thousands of miles of power lines, is a vast electronic machine—more vulnerable to EMP than any other critical infrastructure. Yet the electric grid is the most important of all critical infrastructures, and is in fact the keystone supporting modern civilization, as it powers all the other critical infrastructures. As of now it is our technological Achilles Heel. The EMP Commission found that, if the electric grid collapses, so too will collapse all the other critical infrastructures. But, if the electric grid can be protected and recovered, so too all the other critical infrastructures can also be restored. Transportation is a critical infrastructure because modern civilization cannot exist without the goods and services moved by road, rail, ship, and air. Cars, trucks, locomotives, ships, and aircraft all have electronic components, motors, and controls that are potentially vulnerable to EMP. Gas stations, fuel pipelines, and refineries that make petroleum products depend upon electronic components and cannot operate without electricity. Given our current state of unpreparedness, in the aftermath of a natural or nuclear EMP event, transportation systems would be ~~paralyzed~~. Traffic control systems that avert traffic jams and collisions for road, rail, and air depend upon electronic systems, that the EMP Commission discovered are especially vulnerable to EMP. Communications is a critical infrastructure because modern economies and the cohesion and operation of modern societies depend to a degree unprecedented in history on the rapid movement of information—accomplished today mostly by electronic means. Telephones, cell phones, personal computers, television, and radio are all directly vulnerable to EMP, and cannot operate without electricity. Satellites that operate at Low-Earth-Orbit (LEO) for communications, weather, scientific, and military purposes are vulnerable to EMP and to collateral effects from an EMP attack. Within weeks of an EMP event, the LEO satellites, which comprise most satellites, would probably be inoperable. Banking and finance are the critical infrastructure that sustain modern economies. Whether it is the stock market, the financial records of a multinational corporation, or the ATM card of an individual—financial transactions and record keeping all depend now at the macro- and micro-level upon computers and electronic automated systems. Many of these are directly vulnerable to EMP, and none can operate without electricity. The EMP Commission found that an EMP event could transform the modern electronic economy into a feudal economy based on barter. Food has always been vital to every person and every civilization. The critical infrastructure for producing, delivering, and storing food depends upon a complex web of technology, including machines for planting and harvesting and packaging, refrigerated vehicles for long-haul transportation, and temperature-controlled warehouses. Modern technology enables over 98 percent of the U.S. National population to be fed by less than 2 percent of the population. Huge regional warehouses that resupply supermarkets constitute the National food reserves, enough food to feed the Nation for 30–60 days at normal consumption rates, the warehoused food preserved by refrigeration and temperature control systems that typically have enough emergency electrical power (diesel or gas generators) to last only about an average of 3 days. Experience with storm-induced blackouts proves that when these big regional food warehouses lose electrical power, most of the food supply will rapidly spoil. Farmers, less than 2 percent of the population as noted above, cannot feed 310 million Americans if deprived of the means that currently makes possible this technological miracle. Water too has always been a basic necessity to every person and civilization, even more crucial than food. The critical infrastructure for purifying and delivering potable water, and for disposing of and treating waste water, is a vast networked machine powered by electricity that uses electrical pumps, screens, filters, paddles, and sprayers to purify and deliver drinkable water, and to remove and treat waste water. Much of the machinery in the water infrastructure is directly vulnerable to EMP. The system cannot operate without vast amounts of electricity supplied by the power grid. A natural or nuclear EMP event would immediately deprive most of the U.S. National population of running water. Many natural sources of water—lakes, streams, and rivers—would be dangerously polluted by toxic wastes from sewage, industry, and hospitals that would backflow from or bypass wastewater treatment plants, that could no longer intake and treat pollutants without electric power. Many natural water sources that would normally be safe to drink, after an EMP event, would be polluted with human wastes including feces, industrial wastes including arsenic and heavy metals, and hospital wastes including pathogens. Emergency services such as police, fire, and hospitals are the critical infrastructure that upholds the most basic functions of government and society—preserving law and order, protecting property and life. Experience from protracted storm-induced blackouts has shown, for example in the aftermath of Hurricanes Andrew and Katrina, that when the lights go out and communications systems fail and there is no gas for squad cars, fire trucks, and ambulances, the worst elements of society and the worst human instincts rapidly takeover. The EMP Commission found that, given our current state of unpreparedness, a natural or nuclear EMP event could create anarchic conditions that would profoundly challenge the existence of social order.

### AT: Scenario 2

#### No internal link between alienating the US and no longer supporting Ukraine.

#### Russia invades anyways… read the news.

#### Commercial satellite date is key to deter Russia

Erik Gartzke, 1-14-2022, ["Analysis," Washington Post, https://www.washingtonpost.com/politics/2022/01/14/satellites-makes-it-harder-countries-launch-surprise-attacks-thats-ukraines-favor/]/ISEE

The United States, which maintains some of the world’s most advanced reconnaissance satellites, was the first country to sound the alarm about Russia’s military buildup. U.S. officials have used satellite imagery to mobilize public opinion and call for NATO solidarity regarding Russia’s apparent preparations for war. SpaceX, a private aerospace company founded by Elon Musk, launched a Ukrainian reconnaissance satellite into orbit this week. Until now, Ukrainian leaders have had to rely on information supplied from foreign governments, and on commercially available satellite imagery. With its own satellite, Ukraine can ensure that space assets are monitoring the strategic areas of greatest importance to its national security and that it receives the imagery in a timelier fashion. Such imagery can provide valuable insights into the overarching scope of Russia’s activities vis-a-vis Ukraine. For example, observation of Russia’s major bases and staging areas could indicate the timing and location of a potential attack. The widespread availability of commercial satellite imagery also means that nongovernmental groups and even individuals can now monitor Russia’s military behavior, not just intelligence agencies. In April 2014, for example, AAAS’s Geospatial Technologies and Human Rights Project used open-source, high-resolution commercial imagery to analyze activity in and around Russia’s regional military bases and link this activity to the ongoing military campaign in Crimea — and the photographic record contradicted the Kremlin’s denials of involvement. Similar initiatives can again be used to monitor Russia’s current military activity. Don't miss any of TMC's smart analysis! Sign up for our newsletter. Satellites will make Russia’s military aggression more difficult Of course, the Kremlin may still brandish the threat of a large-scale attack to secure concessions from Ukraine and the West, such as demanding that NATO refrain from admitting Ukraine or other former Soviet republics to the security alliance. The space-based spotlight on Russian military activities, however, has allowed Western nations to mobilize public opinion and respond more rapidly, countering the threat of war with the promise of major sanctions, should Russia choose to invade Ukraine.

#### No incentive for Russia-Ukraine escalation – it would literally bankrupt them.

**Dyer 18** (Gwynne Dyer is an historian and independent journalist, has published several books and has had his articles widely syndicated for many years. He is also available for university and corporate speaking engagements, 12-3-2018, "Ukraine: No big war", Bangor Daily News, https://bangordailynews.com/2018/12/03/opinion/contributors/ukraine-no-big-war/, accessed 7-1-2019) ar

The Russian-Ukrainian naval clash in the Black Sea is not going to end up in a world war. Ukraine would love to be part of NATO, but the existing members won’t let it join. Why? Precisely because that might drag them into a war with Russia. Russia doesn’t have any real military alliances either. Various countries sympathise with either Ukraine or Russia, but none of them have obligations to send military help, and they are not going to volunteer. Secondly, there’s not even going to be a full-scale war between Russia and Ukraine because Ukraine would lose. Russia has more than three times the population and its economy is 10 times bigger. The Russian armed forces are far bigger and vastly better armed. No sane Ukrainian would choose an all-out war with Russia regardless of the provocation. The Russians obviously have more options, but conquering Ukraine is probably the furthest thing from their minds. It has no resources they need, and if they occupied the country they would certainly face an ugly and prolonged guerilla war of resistance. They have nothing to gain. They actually have a lot to lose, because a full-scale invasion of Ukraine would trigger a Western reaction that would come close to bankrupting Russia. NATO would conclude that this was the first step in President Vladimir Putin’s plan to reconquer all of the former Soviet empire in Eastern Europe, and start re-arming in a very big way. The Russians would go broke if they tried to keep up. So what we have here is really just a local crisis. The Russians started it in order to make a specific local gain, and they know that they can win. They will not face major Western retaliation because it’s just not a big enough issue. The actual clash on Sunday saw three Ukrainians injured, 29 others arrested, and three Ukrainian navy ships boarded and seized. The ships were trying to pass through a Russian-controlled strait from the Black Sea to the Sea of Azov, a relatively shallow body of water (maximum depth 14 meters) that is about the size of Switzerland. Until the Russians took Crimea from Ukraine four years ago, the strait had Russian territory on one side and Ukrainian territory on the other. A treaty signed in 2003 said that both countries had free access to the Sea of Azov and their respective ports along its coasts, no permission needed.

#### No retaliation

Neely 13 [Megan Neely, is a research intern for the Project on Nuclear Issues, “Doubting Deterrence of Nuclear Terrorism”, March 21, 2013, <http://csis.org/blog/doubting-deterrence-nuclear-terrorism>]

Yet, let’s think about the series of events that would play out if a terrorist organization detonated a weapon in the United States. Let’s assume forensics confirmed the weapon’s origin, and let’s assume, for argument’s sake, that country was Pakistan. Would the United States then retaliate with a nuclear strike? If a nuclear attack occurs within the next four years (a reasonable length of time for such predictions concerning current international and domestic politics), it seems unlikely. Why? First, there’s the problem of time. Though nuclear forensics is useful, it takes time to analyze the data and determine the country of origin. Any justified response upon a state sponsor would not be swift. Second, even if the United States proved the country of origin, it would then be difficult to determine that Pakistan willingly and intentionally sponsored nuclear terrorism. If Pakistan did, then nuclear retaliation might be justified. However, if Pakistan did not, nuclear retaliation over unsecured nuclear materials would be a disproportionate response and potentially further detrimental. Should the United States launch a nuclear strike at Pakistan, Islamabad could see this as an initial hostility by the United States, and respond adversely. An obvious choice, given current tensions in South Asia, is for Pakistan to retaliate against a U.S. nuclear launch on its territory by initiating conflict with India, which could turn nuclear and increase the exchanges of nuclear weapons. Hence, it seems more likely that, after the international outrage at a terrorist group’s nuclear detonation, the United States would attempt to stop the bleeding without a nuclear strike. Instead, some choices might include deploying forces to track down those that supported the suicide terrorists that detonated the weapon, pressuring Pakistan to exert its sovereignty over fringe regions such as the Federally Administered Tribal Areas, and increasing the number of drone strikes in Waziristan.

#### Broadly err neg – people always overestimate the risk of Russia war

Michael O’Hanlon 19, PhD @ Princeton, senior fellow, and director of research in Foreign Policy at the Brookings Institution, “No, we aren’t on the brink of a new Cold War with Russia and China”, https://www.brookings.edu/blog/order-from-chaos/2019/07/13/no-we-arent-on-the-brink-of-a-new-cold-war-with-russia-and-china/

Increasingly in U.S. national security circles, it has become common to hear [talk of a new Cold War](https://www.usatoday.com/story/opinion/2019/04/18/mueller-report-russia-attacked-us-election-cold-war-tactics-column/3507288002/) with great-power rivals. But this way of thinking is imprecise at best, dangerous at worst. A distinguished group of American experts has just [warned against such thinking](https://www.washingtonpost.com/opinions/making-china-a-us-enemy-is-counterproductive/2019/07/02/647d49d0-9bfa-11e9-b27f-ed2942f73d70_story.html?utm_term=.39bc9831463a) in regard to China, lest it create a self-fulfilling prophecy. However unbecoming Vladimir Putin’s rule may be in Moscow, we need a similar corrective for how we think about Russia. The Trump administration’s [2018 National Defense Strategy](https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf), like the second-term Obama administration’s “[Third Offset](https://dod.defense.gov/News/Speeches/Speech-View/Article/606641/the-third-us-offset-strategy-and-its-implications-for-partners-and-allies/)” concept, usefully reemphasizes deterrence of great-power conflict. There can be no doubt that [Russia and China](https://www.usatoday.com/story/opinion/2019/05/12/trump-leadership-vacuum-china-iran-venezuela-north-korea-chaos-column/1169364001/) have both behaved in a much more assertive and threatening manner in recent years. But the United States has a tendency to overdo such policies. In the case of Russia, while NATO’s modernization efforts, and its [modest military reinforcements](https://www.nato.int/cps/en/natohq/topics_136388.htm) in places like the Baltic states and Poland are welcome, we must avoid a pervading mentality that anticipates a struggle with the Kremlin at every turn. COLD WAR RHETORIC ABOUT RUSSIA IS MISCONCEIVED The dangers and fallacies of thinking in Cold-War, zero-sum, and military-first policies towards Russia are several-fold. First, today’s Russia, while both vindictive and ambitious, has nothing like the global ambitions of the Soviet Union. While it expresses a sense of betrayal by the West, it evinces no grandiose concept for worldwide conquest. As authors such as [Timothy Snyder](https://www.amazon.com/Road-Unfreedom-Russia-Europe-America/dp/0525574476/ref=asc_df_0525574476/?tag=hyprod-20&linkCode=df0&hvadid=343221129243&hvpos=1o1&hvnetw=g&hvrand=4298880226099471355&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9053018&hvtargid=aud-643191255296:pla-688474423085&psc=1&tag=&ref=&adgrpid=67797265863&hvpone=&hvptwo=&hvadid=343221129243&hvpos=1o1&hvnetw=g&hvrand=4298880226099471355&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9053018&hvtargid=aud-643191255296:pla-688474423085) and [Robert Kagan](https://www.washingtonpost.com/news/opinions/wp/2019/03/14/feature/the-strongmen-strike-back/?utm_term=.4d33e03571a5) rightly argue, there can be a sort of authoritarian contagion that leaders like Putin could spread. But this is hardly akin to the Kremlin’s Marxist-Leninist ambitions for conquest during the Cold War. Second, a Cold-War-like attitude ignores how much we are still working with Russia on key global security concerns. Russia’s role is especially important given its veto powers at the United Nations Security Council, crucial for policies such as imposing sanctions on threatening nations. If there is someday to be a new deal with Iran to supersede the [2015 Joint Comprehensive Plan of Action](https://www.treasury.gov/resource-center/sanctions/Programs/Pages/jpoa_archive.aspx), or if there is to be a negotiated denuclearization plan of some sort with North Korea, Russia’s support will be crucial. Despite troubled relations in recent years, Moscow generally has supported American policy at the United Nations in regard to these countries. Even in places where Russian policy is distasteful, or even reprehensible, such as in Syria, it will be far easier to solve problems if we can de-conflict our approaches with Moscow — and in fact, certain types of military deconfliction have been taking place for some time there, making possible the defeat of the ISIS caliphate. Third, for all the debate about NATO’s lack of adequate seriousness when it comes to [defense burden-sharing](https://www.realcleardefense.com/articles/2019/02/23/natos_pointless_burden_sharing_debates_114207.html), the alliance remains impressive. Although [only 7 countries](https://www.cnn.com/2019/03/14/politics/nato-defense-spending-target/index.html)meet the official goal of spending at least 2 percent of GDP on their armed forces, NATO collectively accounts for [more than half](https://thedefensepost.com/2018/05/02/nato-half-global-military-spending/) of all world military spending. Most members have significantly [increased their defense budgets](https://www.washingtonpost.com/world/nato-members-increase-defense-spending-for-fourth-year-in-row-following-trump-pressure/2019/03/14/64989228-4595-11e9-94ab-d2dda3c0df52_story.html?utm_term=.471b432c2b9d) since the Crimea crisis of 2014. NATO has also deployed enhanced forward presence battalions to the Baltic states and Poland. They do not constitute a robust defensive perimeter, but they at least represent a stronger tripwire than before. NATO would do well to make its reinforcement capabilities for this region more robust, but it is hard to see Mr. Putin really believing he could get away with an all-out invasion, even today. So far, he has cautiously avoided any military excursions into NATO countries. Fourth, European nations do not get enough credit for the sustaining their sanctions on Russia as a result of its aggressions against Ukraine. Over the last half decade, largely as a result, the Russian economy has [essentially gone flat](https://www.forbes.com/sites/kenrapoza/2019/01/08/sanctions-isolation-and-inflation-are-killing-russian-incomes/#567b81803258). [Gross domestic product](https://tradingeconomics.com/russia/gdp) and [foreign direct investment](https://www.themoscowtimes.com/2019/05/22/foreign-direct-investment-into-russia-is-falling-a65690) in Russia have both declined since its Crimean invasion. Not only has this outcome delivered a useful punitive blow against Putin and many of his cronies, it has quite possibly helped dissuade any further Russian aggression, be it against Ukraine or Georgia or even a Baltic state, adding another dimension of deterrence to what NATO is doing militarily. A greater integration of economic and military measures of deterrence should be pursued in the United States and NATO, as one of us has recently argued in a new book, [The Senkaku Paradox](https://www.amazon.com/Senkaku-Paradox-Risking-Great-Stakes-ebook/dp/B07G2LSSCJ). More credible policies are needed in particular for limited and grey-area conflict zones. Such scenarios do indeed remain worrisome, as Russia continues to engage in disinformation campaigning and election meddling — but these efforts should not be confused with the existential risks of the Cold War. WE CAN DEFUSE TENSIONS WITH RUSSIA And finally, thinking in Cold-War terms can blind us to the need to debate some of our own policies, where there may be opportunities to defuse U.S.-Russia tensions with creative ideas. A case in point is the future of NATO expansion, especially into former Soviet republics. Since [2008](https://www.nato.int/cps/en/natohq/official_texts_8443.htm?selectedLocale=en), NATO has officially promised to bring Ukraine and Georgia into the alliance at some point in the future. President Obama and President Trump have both let this Bush administration initiative stand. That would be a mistake. Geographically and strategically, such a move would be a bridge too far for an alliance that was designed to stabilize the North Atlantic region. Moreover, while nothing can excuse Russia’s aggressions, the net effect of that 2008 NATO announcement, which contained no timetable for eventual membership for Georgia and Ukraine and no interim security guarantee as they waited, was to paint a giant bullseye on each of their metaphorical backs. We need to work out a new concept for security in eastern Europe that would enhance their security short of alliance membership, rather than degrade it as a half-serious promise of future alliance membership has done to date. All other national options that any sovereign state should enjoy, such as the right to join the EU if invited, must be protected in such an arrangement, but NATO membership would be counterproductive. Indeed, under present conditions, it is really not even possible. The world is unsettled, and risky, yes. But those who liken the contemporary environment to the Cold War may have forgotten how profoundly dangerous most of the latter period really was.