## 1AC

### ADV 1 - Debris

#### Recent US legislation ensures private space mining and ownership allowed now

Williams 20 [(Matt Williams, Reporter) “Trump signs an executive order allowing mining the moon and asteroids,” Phys Org, April 13, 2020, <https://phys.org/news/2020-04-trump-moon-asteroids.html>] TDI

Trump signs an executive order allowing mining the moon and asteroids

In 2015, the Obama administration signed the [U.S. Commercial Space Launch Competitiveness Act](https://www.congress.gov/bill/114th-congress/house-bill/2262/text) (CSLCA, or H.R. 2262) into law. This bill was intended to "facilitate a pro-growth environment for the developing commercial space industry" by making it legal for American companies and citizens to own and sell resources that they extract from asteroids and off-world locations (like the moon, Mars or beyond).

On April 6th, the Trump administration took things a step further by signing an [executive order](https://www.space.com/trump-moon-mining-space-resources-executive-order.html) that formally recognizes the rights of private interests to claim resources in [space](https://phys.org/tags/space/). This order, titled "[Encouraging International Support for the Recovery and Use of Space Resources](https://www.whitehouse.gov/presidential-actions/executive-order-encouraging-international-support-recovery-use-space-resources/)," effectively ends the decades-long debate that began with the signing of [the Outer Space Treaty](https://www.universetoday.com/20590/moon-for-sale/) in 1967.

#### New investments coming and companies are launching into asteroid mining – economic incentives make it alluring

Tosar 20 [(Borja Tosar, reporter) “Asteroid Mining: A New Space Race,” OpenMind BBVA, May 18, 2020, <https://www.bbvaopenmind.com/en/science/physics/asteroid-mining-a-new-space-race/>] TDI

This is not science fiction. There are now space mining companies, such as [Planetary Resources,](https://www.consensys.space/pr) which has already launched several mini-satellites to test several of its patents. Other companies like [Asteroid Mining Corporation](https://asteroidminingcorporation.co.uk/) or [Trans Astronautica Corporation,](https://www.transastracorp.com/) although still far from their goal, are already attracting millions of dollars of private investment interested in being on the front line of a possible future space business.

Is asteroid mining possible? This new space race already began back when the Hayabusa missions successfully returned a few grams of an asteroid’s regolith, so the technology to harvest asteroid material exists, we just have to change the scale. It is no longer a technological problem.

Is it economically viable? We are increasingly dependent on rare elements (such as those in the palladium group), which are expensive to exploit on Earth and come with a high environmental cost, so the sum of these two factors could make it profitable to travel to the asteroids to extract these raw materials. Astrophysicist Neil deGrasse argues that [the planet’s first trillionaire will undoubtedly be a space miner.](https://www.cnbc.com/2015/05/01/build-the-economy-here-on-earth-by-exploring-space-tyson.html)

#### Asteroid mining spikes the risk of satellite-dust collisions

Scoles 15 [(Sarah Scoles, freelance science writer, contributor at Wired and Popular Science, author of the books Making Contact and They Are Already Here) “Dust from asteroid mining spells danger for satellites,” New Scientist, May 27, 2015, <https://www.newscientist.com/article/mg22630235-100-dust-from-asteroid-mining-spells-danger-for-satellites/>] TDI

* Study this is citing – Javier Roa, Space Dynamic Group, Applied Physics Department, Technical University of Madrid. Casey J Handmer, Theoretical Astrophysics, California Institute of Technology. Both PhD Candidates. “Quantifying hazards: asteroid disruption in lunar distant retrograde orbits,” arXiv, Cornell University, May 14, 2015, <https://arxiv.org/pdf/1505.03800.pdf>

NASA chose the second option for its [Asteroid Redirect Mission](http://www.nasa.gov/content/what-is-nasa-s-asteroid-redirect-mission/), which aims to [pluck a boulder from an asteroid’s surface](https://www.newscientist.com/article/dn27243-rock-grab-from-asteroid-will-aid-human-mission-to-mars) and relocate it to a stable orbit around the moon. But an asteroid’s gravity is so weak that it’s not hard for surface particles to escape into space. Now a new model warns that debris shed by such transplanted rocks could intrude where many defence and communication satellites live – in geosynchronous orbit.

According to [Casey Handmer](http://www.caseyhandmer.com/) of the California Institute of Technology in Pasadena and Javier Roa of the Technical University of Madrid in Spain, 5 per cent of the escaped debris will end up in regions traversed by satellites. Over 10 years, it would cross geosynchronous orbit 63 times on average. A satellite in the wrong spot at the wrong time will suffer a damaging high-speed collision with that dust.

The study also looks at the “catastrophic disruption” of an asteroid 5 metres across or bigger. Its total break-up into a pile of rubble would increase the risk to satellites by more than 30 per cent ([arxiv.org/abs/1505.03800](http://arxiv.org/abs/1505.03800)).

#### Space dust wrecks satellites and collisions multiply particles – limited space dust already causes damage which privatized mining exponentially worsens

Intagliata 17 [(Christopher Intagliata, MA Journalism from NYU, Editor for NPRs All Things Considered, Reporter/Host for Scientific American’s 60 Second Science) “The Sneaky Danger of Space Dust,” Scientific American, May 11, 2017, <https://www.scientificamerican.com/podcast/episode/the-sneaky-danger-of-space-dust/>] TDI

When tiny particles of space debris slam into satellites, the collision could cause the emission of hardware-frying radiation, Christopher Intagliata reports.

Aside from all the satellites, and the space station orbiting the Earth, there's a lot of trash circling the planet, too. Twenty-one thousand [baseball-sized chunks](https://www.scientificamerican.com/article/orbital-debris-space-fence/) of debris, [according to NASA](https://www.orbitaldebris.jsc.nasa.gov/faq.html). But that number's dwarfed by the number of small particles. There's hundreds of millions of those.

"And those smaller particles tend to be going fast. Think of picking up a grain of sand at the beach, and that would be on the large side. But they're going 60 kilometers per second."

Sigrid Close, an applied physicist and astronautical engineer at Stanford University. Close says that whereas mechanical damage—like punctures—is the worry with the bigger chunks, the dust-sized stuff might leave more insidious, invisible marks on satellites—by causing electrical damage.

"We also think this phenomenon can be attributed to some of the failures and anomalies we see on orbit, that right now are basically tagged as 'unknown cause.'"

Close and her colleague Alex Fletcher modeled this phenomenon mathematically, based on plasma physics behavior. And here's what they think happens. First, the dust slams into the spacecraft. Incredibly fast. It vaporizes and ionizes a bit of the ship—and itself. Which generates a cloud of ions and electrons, traveling at different speeds. And then: "It's like a spring action, the electrons are pulled back to the ions, ions are being pushed ahead a little bit. And then the electrons overshoot the ions, so they oscillate, and then they go back out again.”

That movement of electrons creates a pulse of electromagnetic radiation, which Close says could be the culprit for some of that electrical damage to satellites. The study is in the journal Physics of Plasmas. [Alex C. Fletcher and Sigrid Close, [Particle-in-cell simulations of an RF emission mechanism associated with hypervelocity impact plasmas](http://aip.scitation.org/doi/full/10.1063/1.4980833)]

#### Scenario 1 is Climate

#### Earth observation satellites key to warming adaptation

Alonso 18 [(Elisa Jiménez Alonso, communications consultant with Acclimatise, climate resilience organization) “Earth Observation of Increasing Importance for Climate Change Adaptation,” Acclimatise, May 2, 2018, <https://www.acclimatise.uk.com/2018/05/02/earth-observation-of-increasing-importance-for-climate-change-adaptation/>] TDI

Earth observation (EO) satellites are playing an increasingly important role in assessing climate change. By providing a constant and consistent stream of data about the state of the climate, EO is not just improving scientific outcomes but can also inform climate policy.

Managing climate-related risks effectively requires accurate, robust, sustained, and wide-ranging climate information. Reliable observational climate data can help scientists test the accuracy of their models and improve the science of attributing certain events to climate change. Information based on projections from models and historic data can help decision makers plan and implement adaptation actions.

Providing information in data-sparse regions

Ground-based weather and climate monitoring systems only cover about 30% of the Earth’s surface. In many parts of the world such data is incomplete and patchy due to poorly maintained weather stations and a general lack of such facilities.

EO satellites and rapidly improving satellite technology, especially data from open access programmes, offer a valuable source information for such data-sparse regions. This is especially important since countries and regions with a lack of climate data are often particularly vulnerable to climate change impacts.

International efforts for systematic observation

The importance of satellite-based observations is also recognised by the international community. Following the recommendations of the World Meteorological Organization’s (WMO) Global Climate Observing System (GCOS) programme, the UNFCCC strongly encourages countries that support space agencies with EO programmes to get involved in GCOS and support the programme’s implementation. The Paris Agreement highlights the need for and importance of effective and progressive responses to the threat of climate change based on the best available scientific knowledge. This implies that climate knowledge needs to be strengthened, which includes continuously improving systematic observations of the Earth’s climate.

To meet the need of such systematic climate observations, GCOS developed the concept of the Essential Climate Variable, or ECV. According to WMO, an ECV “is a physical, chemical or biological variable or a group of linked variables that critically contributes to the characterization of Earth’ s climate.” In 2010, 50 ECVs which would help the work of the UNFCCC and IPCC were defined by GCOS. The ECVs, which can be seen below, were identified due to their relevance for characterising the climate system and its changes, the technical feasibility of observing or deriving them on a global scale, and their cost effectiveness.

The 50 Essential Climate Variables as defined by GCOS.

One effort supporting the systemic observation of the climate is the European Space Agency’s (ESA) Climate Change Initiative (CCI). The programme taps into its own and its member countries’ EO archives that have been established in the last three decades in order to provide a timely and adequate contribution to the ECV databases required by the UNFCCC.

Robust evidence supporting climate risk management

Earth observation satellites can observe the entire Earth on a daily basis (polar orbiting satellites) or continuously monitor the disk of Earth below them (geostationary satellites) maintaining a constant watch of the entire globe. Sensors can target any point on Earth even the most remote and inhospitable areas which helps monitor deforestation in vast tropical forests and the melting of the ice caps.

Without insights offered by EO satellites there would not be enough evidence for decision makers to base their climate policies on, increasing the risk of maladaptation. Robust EO data is an invaluable resource for collecting climate information that can inform climate risk management and make it more effective.

#### Warming causes extinction

Klein 14[(Naomi Klein, award-winning journalist, syndicated columnist, former Miliband Fellow at the London School of Economics, member of the board of directors of 350.org), *This Changes Everything: Capitalism vs. the Climate*, pp. 12-14]

In a 2012 report, the World Bank laid out the gamble implied by that target. “As global warming approaches and exceeds 2-degrees Celsius, there is a risk of triggering nonlinear tipping elements. Examples include the disintegration of the West Antarctic ice sheet leading to more rapid sea-level rise, or large-scale Amazon dieback drastically affecting ecosystems, rivers, agriculture, energy production, and livelihoods. This would further add to 21st-century global warming and impact entire continents.” In other words, once we allow temperatures to climb past a certain point, where the mercury stops is not in our control.¶ But the bigger problem—and the reason Copenhagen caused such great despair—is that because governments did not agree to binding targets, they are free to pretty much ignore their commitments. Which is precisely what is happening. Indeed, emissions are rising so rapidly that unless something radical changes within our economic structure, 2 degrees now looks like a utopian dream. And it’s not just environmentalists who are raising the alarm. The World Bank also warned when it released its report that “we’re on track to a 4-C warmer world [by century’s end] marked by extreme heat waves, declining global food stocks, loss of ecosystems and biodiversity, and life-threatening sea level rise.” And the report cautioned that, “there is also no certainty that adaptation to a 4-C world is possible.” Kevin Anderson, former director (now deputy director) of the Tyndall Centre for Climate Change, which has quickly established itself as one of the U.K’s premier climate research institutions, is even blunter; he says 4 degrees Celsius warming—7.2 degrees Fahrenheit—is “incompatible with an organized, equitable, and civilized global community.”¶ We don’t know exactly what a 4 degree Celsius world would look like, but even the best-case scenario is likely to be calamitous. Four degrees of warming could raise global sea levels by 1 or possibly even 2 meters by 2100 (and would lock in at least a few additional meters over future centuries). This would drown some island nations such as the Maldives and Tuvalu, and inundate many coastal areas from Ecuador and Brazil to the Netherlands to much of California and the northeastern United States as well as huge swaths of South and Southeast Asia. Major cities likely in jeopardy include Boston, New York, greater Los Angeles, Vancouver, London, Mumbai, Hong Kong, and Shanghai.¶ Meanwhile, brutal heat waves that can kill tens of thousands of people, even in wealthy countries, would become entirely unremarkable summer events on every continent but Antarctica. The heat would also cause staple crops to suffer dramatic yield losses across the globe (it is possible that Indian wheat and U.S. could plummet by as much as 60 percent), this at a time when demand will be surging due to population growth and a growing demand for meat. And since crops will be facing not just heat stress but also extreme events such as wide-ranging droughts, flooding, or pest outbreaks, the losses could easily turn out to be more severe than the models have predicted. When you add ruinous hurricanes, raging wildfires, fisheries collapses, widespread disruptions to water supplies, extinctions, and globe-trotting diseases to the mix, it indeed becomes difficult to imagine that a peaceful, ordered society could be sustained (that is, where such a thing exists in the first place).¶ And keep in mind that these are the optimistic scenarios in which warming is more or less stabilized at 4 degrees Celsius and does not trigger tipping points beyond which runaway warming would occur. Based on the latest modeling, it is becoming safer to assume that 4 degrees could bring about a number of extremely dangerous feedback loops—an Arctic that is regularly ice-free in September, for instance, or, according to one recent study, global vegetation that is too saturated to act as a reliable “sink”, leading to more carbon being emitted rather than stored. Once this happens, any hope of predicting impacts pretty much goes out the window. And this process may be starting sooner than anyone predicted. In May 2014, NASA and the University of California, Irvine scientists revealed that glacier melt in a section of West Antarctica roughly the size of France now “appears unstoppable.” This likely spells down for the entire West Antarctic ice sheet, which according to lead study author Eric Rignot “comes with a sea level rise between three and five metres. Such an event will displace millions of people worldwide.” The disintegration, however, could unfold over centuries and there is still time for emission reductions to slow down the process and prevent the worst. ¶ Much more frightening than any of this is the fact that plenty of mainstream analysts think that on our current emissions trajectory, we are headed for even more than 4 degrees of warming. In 2011, the usually staid International Energy Agency (IEA) issued a report predicting that we are actually on track for 6 degrees Celsius—10.8 degrees Fahrenheit—of warming. And as the IEA’s chief economist put it: “Everybody, even the school children, knows that this will have catastrophic implications for all of us.” (The evidence indicates that 6 degrees of warming is likely to set in motion several major tipping points—not only slower ones such as the aforementioned breakdown of the West Antarctic ice sheet, but possibly more abrupt ones, like massive releases of methane from Arctic permafrost.) The accounting giant PricewaterhouseCoopers as also published a report warning businesses that we are headed for “4-C , or even 6-C” of warming.¶ These various projections are the equivalent of every alarm in your house going off simultaneously. And then every alarm on your street going off as well, one by one by one. They mean, quite simply, that climate change has become an existential crisis for the human species. The only historical precedent for a crisis of this depth and scale was the Cold War fear that we were headed toward nuclear holocaust, which would have made much of the planet uninhabitable. But that was (and remains) a threat; a slim possibility, should geopolitics spiral out of control. The vast majority of nuclear scientists never told us that we were almost certainly going to put our civilization in peril if we kept going about our daily lives as usual, doing exactly what we were already going, which is what climate scientists have been telling us for years. ¶ As the Ohio State University climatologist Lonnie G. Thompson, a world-renowned specialist on glacier melt, explained in 2010, “Climatologists, like other scientists, tend to be a stolid group. We are not given to theatrical rantings about falling skies. Most of us are far more comfortable in our laboratories or gathering data in the field than we are giving interviews to journalists or speaking before Congressional committees. When then are climatologists speaking out about the dangers of global warming? The answer is that virtually all of us are now convinced that global warming poses a clear and present danger to civilization.”

#### Scenario 2 is Miscalc

#### Early warning satellites going dark signals attacks – causes miscalc and goes nuclear

Orwig 16 [(Jessica, MS in science and tech journalism from Texas A&M, BS in astronomy and physics from Ohio State) “Russia says a growing problem in space could be enough to spark a war,” Insider,’ January 26, 2016, <https://www.businessinsider.com/russia-says-space-junk-could-spark-war-2016-1>] TDI

NASA has already warned that the large amount of space junk around our planet is growing beyond our control, but now a team of Russian scientists has cited another potentially unforeseen consequence of that debris: War.

Scientists estimate that anywhere from 500,000 to 600,000 pieces of human-made space debris between 0.4 and 4 inches in size are currently orbiting the Earth and traveling at speeds over 17,000 miles per hour.

If one of those pieces smashed into a military satellite it "may provoke political or even armed conflict between space-faring nations," Vitaly Adushkin, a researcher for the Institute of Geosphere Dynamics at the Russian Academy of Sciences, reported in a paper set to be published in the peer-reviewed journal Acta Astronautica, which is sponsored by the International Academy of Astronautics.

Say, for example, that a satellite was destroyed or significantly damaged in orbit — something that a 4-inch hunk of space junk could easily do traveling at speeds of 17,500 miles per hour, Adushkin reported. (Even smaller pieces no bigger than size of a pea could cause enough damage to the satellite that it would no longer operate correctly, he notes.)

It would be difficult for anyone to determine whether the event was accidental or deliberate.

This lack of immediate proof could lead to false accusations, heated arguments and, eventually, war, according to Adushkin and his colleagues.

A politically dangerous dilemma

In the report, the Adushkin said that there have already been repeated "sudden failures" of military spacecraft in the last two decades that cannot be explained.

"So, there are two possible explanations," he wrote. The first is "unregistered collisions with space objects." The second is "machinations" [deliberate action] of the space adversary.

"This is a politically dangerous dilemma," he added.

But these mysterious failures in the past aren't what concerns Adushkin most.

It's a future threat of what experts call the cascade effect that has Adushkin and other scientists around the world extremely concerned.

The Kessler Syndrome

In 1978, American astrophysicist Donald Kessler predicted that the amount of space debris around Earth would begin to grow exponentially after the turn of the millennium.

Kessler 's predictions rely on the fact that over time, space junk accumulates. We leave most of our defunct satellites in space, and when meteors and other man-made space debris slam into them, you get a cascade of debris.

The cascade effect — also known as the Kessler Syndrome — refers to a critical point wherein the density of space junk grows so large that a single collision could set off a domino effect of increasingly more collisions.

For Kessler, this is a problem because it would "create small debris faster than it can be removed," Kessler said last year. And this cloud of junk could eventually make missions to space too dangerous.

For Adushkin, this would exacerbate the issue of identifying what, or who, could be behind broken satellites.

The future

So far, the US and Russian Space Surveillance Systems have catalogued 170,000 pieces of large space debris (between 4 and 8 inches wide) and are currently tracking them to prevent anymore dilemmas like the ones Adushkin and his colleagues cite in their paper.

But it's not just the large objects that concern Adushkin, who reported that even small objects (less than 1/3 of an inch) could damage satellites to the point they can't function properly.

Using mathematical models, Adushkin and his colleagues calculated what the situtation will be like in 200 years if we continue to leave satellites in space and make no effort to clean up the mess. They estimate we'll have:

1.5 times more fragments greater than 8 inches across

3.2 times more fragments between 4 and 8 inches across

13-20 times more smaller-sized fragments less than 4 inches across

"The number of small-size, non-catalogued objects will grow exponentially in mutual collisions," the researchers reported.

#### Nuke war causes extinction – it won’t stay limited

Edwards 17 [(Paul N. Edwards, CISAC’s William J. Perry Fellow in International Security at Stanford’s Freeman Spogli Institute for International Studies. Being interviewed by EarthSky/card is only parts of the interview directly from Paul Edwards.) “How nuclear war would affect Earth’s climate,” EarthSky, September 8, 2017, earthsky.org/human-world/how-nuclear-war-would-affect-earths-climate] TDI

We are not talking enough about the climatic effects of nuclear war.

The “nuclear winter” theory of the mid-1980s played a significant role in the arms reductions of that period. But with the collapse of the Soviet Union and the reduction of U.S. and Russian nuclear arsenals, this aspect of nuclear war has faded from view. That’s not good. In the mid-2000s, climate scientists such as Alan Robock (Rutgers) took another look at nuclear winter theory. This time around, they used much-improved and much more detailed climate models than those available 20 years earlier. They also tested the potential effects of smaller nuclear exchanges.

The result: an exchange involving just 50 nuclear weapons — the kind of thing we might see in an India-Pakistan war, for example — could loft 5 billion kilograms of smoke, soot and dust high into the stratosphere. That’s enough to cool the entire planet by about 2 degrees Fahrenheit (1.25 degrees Celsius) — about where we were during the Little Ice Age of the 17th century. Growing seasons could be shortened enough to create really significant food shortages. So the climatic effects of even a relatively small nuclear war would be planet-wide.

What about a larger-scale conflict?

A U.S.-Russia war currently seems unlikely, but if it were to occur, hundreds or even thousands of nuclear weapons might be launched. The climatic consequences would be catastrophic: global average temperatures would drop as much as 12 degrees Fahrenheit (7 degrees Celsius) for up to several years — temperatures last seen during the great ice ages. Meanwhile, smoke and dust circulating in the stratosphere would darken the atmosphere enough to inhibit photosynthesis, causing disastrous crop failures, widespread famine and massive ecological disruption.

The effect would be similar to that of the giant meteor believed to be responsible for the extinction of the dinosaurs. This time, we would be the dinosaurs.

Many people are concerned about North Korea’s advancing missile capabilities. Is nuclear war likely in your opinion?

At this writing, I think we are closer to a nuclear war than we have been since the early 1960s. In the North Korea case, both Kim Jong-un and President Trump are bullies inclined to escalate confrontations. President Trump lacks impulse control, and there are precious few checks on his ability to initiate a nuclear strike. We have to hope that our generals, both inside and outside the White House, can rein him in.

North Korea would most certainly “lose” a nuclear war with the United States. But many millions would die, including hundreds of thousands of Americans currently living in South Korea and Japan (probable North Korean targets). Such vast damage would be wrought in Korea, Japan and Pacific island territories (such as Guam) that any “victory” wouldn’t deserve the name. Not only would that region be left with horrible suffering amongst the survivors; it would also immediately face famine and rampant disease. Radioactive fallout from such a war would spread around the world, including to the U.S.

It has been more than 70 years since the last time a nuclear bomb was used in warfare. What would be the effects on the environment and on human health today?

To my knowledge, most of the changes in nuclear weapons technology since the 1950s have focused on making them smaller and lighter, and making delivery systems more accurate, rather than on changing their effects on the environment or on human health. So-called “battlefield” weapons with lower explosive yields are part of some arsenals now — but it’s quite unlikely that any exchange between two nuclear powers would stay limited to these smaller, less destructive bombs.

### ADV 2 – Africa War

#### Space mining destroys the African economy

Oni 19 [(David, a space industry and technology analyst at Space in Africa. He’s a graduate of Mining Engineering from the Federal University of Technology Akure.) “The Effect of Asteroid Mining on Mining Activities in Africa,” Africa News, 9/24/19, <https://africanews.space/the-effect-of-asteroid-mining-on-mining-activities-in-africa/>]

At the moment, Asteroid mining poses no threat to terrestrial mining; however, this will not hold for long. The space industry is progressing at such a rapid pace, and the prospects are unequivocally mouth-watering. The big question is, will asteroid mining lure away investors in Africa? The planetary resources company estimates that a single 30-m asteroid may contain 30 billion dollars in platinum alone and a 500m rock could contain half the entire world resources of PGM. Considering the abundance of minerals in asteroids, once asteroid mining materialises, it will severely affect the precious metals market, usurp the prices of rare earth minerals, and a whole lot more because minerals that are usually somewhat scarce on earth will be easily accessible on asteroids. While foreign investors run the majority of the large-scale mining activities in the region, reports say that many African countries are dangerously dependent on mining activities. For some African countries, despite massive mineral wealth, their mining sectors are underdeveloped, and this is as a result of much focus on oil resources and a couple of other challenges. The million-dollar question is, what will become of the mining activities in Africa?

#### Economic decline causes Africa war

Tollefsen 17 [(Andreas Forø, Peace Research Institute Oslo (PRIO) and Ph.D. in Human Geography from the University of Oslo) “Experienced poverty and local conflict violence," Conflict Management and Peace Science, 12/21/17, <https://www.researchgate.net/publication/320740608_Experienced_poverty_and_local_conflict_violence>]

The present study’s empirical contributions seek to help rectify the inadequate measures of poverty that have come to characterize the literature. To begin with, the article improves our understanding of whether and where a local poverty–conflict nexus exists by deploying experiential data on individuals’ actual wellbeing—which I argue is more closely connected to people’s motives and rationale for taking up arms. Second, the article examines the sociopolitical context’s conditioning effect on the poverty–conflict nexus. This is achieved by including data on individuals’ perceptions surrounding the quality of their local institutions, the presence of group grievances, and local unemployment rates. These factors, I argue, are more closely linked to reasons for fighting than are common proxies such as night-time luminosity and estimates of economic activity, both of which are often derived from dividing GDP per capita by local population counts.

Poverty—a state in which individuals’ basic needs go unmet—has been shown to motivate people to join rebellions. Humphreys and Weinstein (2008), for instance, found that poverty predicted inscription in the Revolutionary United Front during Sierra Leone’s civil war. Barrett (2011) similarly saw how promises of loot lured the poor to enlist in the 1997– 1998 dispute in Nigeria’s local government area known as Toto. Combatants of the Toto conflict were also more likely to join the rebellion if they stood to gain personal protection, food, and shelter.

For the present study, I developed a dataset by aggregating survey responses from the pan-African Afrobarometer survey to subnational districts and combining the results with information on post-survey violent conflicts. The dataset consists of 4008 subnational districts, spanning 35 African countries. As most districts were only assessed once, thus restricting study of within-unit variation, survey responses were also aggregated to higher-order subnational regions, resulting in a dataset of 111 regions that were surveyed at least twice; this permitted a region-level fixed-effects model design.

Using a pooled cross-sectional dataset of districts, I found that high levels of poverty were linked to increases in local conflict-based violence. Districts with a large share of poor individuals, both in absolute terms and relative to country average, had a higher risk ofconflict than more affluent areas. This relationship held in a coarsened exact matching setup, as well as in a region-level fixed effects design with repeated measurements across time. While the results reveal a local poverty–conflict link, they do not aid in uncovering underlying mechanisms.

Using interactions models, I found that poverty increased the risk of conflict, although only where local institutions are weak. The results also show that poverty-stricken areas in which individuals strongly perceive group injustice have a greater risk of conflict than similarly impoverished regions with no aggrieved population. A departure from the local individual opportunity cost explanation, local economic opportunities do not seem to condition the poverty–conflict nexus. In sum, the results suggest that while poverty is significantly connected to conflict, high-quality institutions and inclusiveness of ethnic groups can prevent violence. Although a wide range of robustness checks and alternative model specifications were implemented, including matching and fixed-effects models, the issue of endogeneity could not be ruled out; doing so would require some kind of exogenous instrument, which I have been unable to identify.

The remainder of this article elaborates on the theoretical framework linking subnational poverty to local conflict-based violence. This is followed by a discussion of existing methods for measuring local poverty and their potential shortcomings. Next presented is the study’s research design and modeling strategy, followed by a discussion of empirical results. The conclusion considers the study’s limitations and proposes avenues for future research on poverty in locations that support rebel groups.

Poverty and conflict

A direct link

A connection between low income and risk of conflict is among the most robust findings in the literature on civil wars (Hegre and Sambanis, 2006). However, there is little consensus on the mechanisms through which poverty may produce conflict. Collier and Hoeffler (1998) claimed that low per-capita income lowers the opportunity cost of rebellion because when they have less to lose from taking up arms, poorer individuals become more inclined to rebel. Fearon and Laitin (2003) observed that poorer countries experience more conflict because they are unable to monitor and control all of their territory, thereby creating pockets of hospitable conditions for insurgents; Tollefsen and Buhaug (2015) identified a similar scenario at the local level.

#### Great power war

Yeisley 11 [(USAF Lieutenant Colonel Mark O. Yeisley, assistant professor of international relations at the School of Advanced Air and Space Studies, Maxwell AFB, Alabama. MA Colorado State, PhD in international relations from Duke University) “Bipolarity, Proxy Wars, and the Rise of China,” Strategic Studies Quarterly, Winter 2011, <https://www.jstor.org/stable/26270538?seq=1#metadata_info_tab_contents>] TDI

Bipolarity, Nuclear Weapons, and Sino-US Proxy Conflict in Africa

It is likely China will achieve economic and then military parity with the United States in the next two decades. China currently possesses 240 nuclear warheads and 135 ballistic missiles capable of reaching the United States or its allies; that number of nuclear warheads is estimated to double by the mid 2020s.43 As during the Cold War, a bipolar system in which war between the United States and China is too costly will lead to policy decisions that seek conflict resolution elsewhere.44 But why would China’s rising necessarily lead to geostrategic competition with the United States, and where would this most likely occur? Unlike the Cold War, access to strategic resources rather than ideology would lie at the heart of future US-Sino competition, and the new “great game” will most likely be played in Africa.

Despite Communist Party control of its government, China is not interested in spreading its version of communism and is much more pragmatic in its objectives—securing resources to meet the needs of its citizens and improve their standard of living.45 Some estimates show that China will overtake the United States to become the world’s largest economy by 2015, and rising powers usually take the necessary steps to “ensure markets, materials, and transportation routes.”46 China is the leading global consumer of aluminum, copper, lead, nickel, zinc, tin, and iron ore, and its metal needs now represent more than 25 percent of the world’s total.47 In contrast, from 1970 to 1995, US consumption of all materials, including metals, accounted for one-third of the global total despite representing only 5 percent of the world’s population.48 China is the largest energy consumer, according to the International Energy Agency, surpassing the United States in consumption of oil, coal, and natural gas in 2009.49 As the two largest consumers of both global energy and materials, the United States and China must seek foreign policy prescriptions to fulfill future resource needs. While the United States can alleviate some of its energy needs via bio- or coal-based fuels, hydrogen, or natural gas alternatives, China currently lacks the technological know-how to do so and remains tied to a mainly nonrenewable energy resource base. Since the majority of these needs are nonrenewable, competition of necessity will be zero-sum and will be conducted via all instruments of power.50

Africa is home to a wealth of mineral and energy resources, much of which still remains largely unexploited. Seven African states possess huge endowments of oil, and four of these have equally substantial amounts of natural gas.51 Africa also enjoys large deposits of bauxite (used to make aluminum), copper, lead, nickel, zinc, and iron ore, all of which are imported and highly desired by China. Recent activity serves to prove that China seeks greater access to natural resources in Africa by avidly promoting Chinese development in a large number of African nations. South Africa, the continent’s largest economy, has recently allowed China to help develop its vast mineral wealth; it is China’s number one African source of manganese, iron, and copper.52 Chinese involvement in Africa is not wholly extractive; the continent provides a booming export market for China’s goods and a forum to augment its soft power in the region by offering alternatives to the political and economic baggage that accompanies US foreign aid.53

Of primary interest is open access to Africa’s significant deposits of oil and other energy resources. For example, China has 4,000 military personnel in Sudan to protect its interests in energy and mineral investments there; it also owns 40 percent of the Greater Nile Oil Production Company.54 Estimates indicate that within the next few decades China will obtain 40 percent of its oil and gas supplies from Africa.55 Trade and investment in Africa have also been on the rise; trade has grown more than 10 percent annually in the past decade. Between 2002 and 2004, African exports to China doubled, ranking it third behind the United States and France in trade with the continent. Chinese investment is also growing; more than 700 Chinese business operations across Africa total over $1 billion. Aid and direct economic assistance are increasing as well, and China has forgiven the debt of some 31 African nations.56

Africa is thus a vital foreign interest for the Chinese and must be for the United States; access to its mineral and petroleum wealth is crucial to the survival of each.57 Although the US and Chinese economies are tightly interconnected, the nonrenewable nature of these assets means competition will remain a zero-sum game. Nearly all African states have been independent entities for less than 50 years; consolidating robust domestic state institutions and stable governments remains problematic.58 Studies have shown that weak governments are often prime targets for civil conflicts that prove costly to control.59 Many African nations possess both strategic resources and weak regimes, making them vulnerable to internal conflict and thus valuable candidates for assistance from China or the United States to help settle their domestic grievances. With access to African resources of vital strategic interest to each side, competition could likely occur by proxy via diplomatic, economic, or military assistance to one (or both) of the parties involved.

Realist claims that focusing on third-world issues is misplaced are thus fallacious; war in a future US-China bipolar system remains as costly as it was during the Cold War. Because of the fragile nature of many African regimes, domestic grievances are more prone to result in conflict; US and Chinese strategic interests will dictate an intrusive foreign policy to be both prudent and vital. US-Sino proxy conflicts over control of African resources will likely become necessary if these great powers are to sustain their national security postures, especially in terms of strategic defense.60

### Plan

#### Plan – states ought to ban the appropriation of outer space for mining activities by private entities.

#### Normal means is ratification of the Moon Treaty

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A third possible option is to get a larger global endorsement of the Moon Treaty, which highlights the common heritage of mankind. The Moon Treaty is important as it addresses a “loophole” of the OST “by banning any ownership of any extraterrestrial property by any organization or private person, unless that organization is international and governmental.”[[lxiv]](https://www.orfonline.org/research/if-space-is-the-province-of-mankind-who-owns-its-resources-47561/#_edn64) But the fact that it has been endorsed only by a handful of countries makes it a “failure” from the international law perspective.[[lxv]](https://www.orfonline.org/research/if-space-is-the-province-of-mankind-who-owns-its-resources-47561/#_edn65) Nevertheless, efforts must be made to strengthen the support base for the Moon Agreement given the potential pitfalls of resource extraction and space mining activities in outer space. Signatories to the Moon Treaty can take the lead within multilateral platforms such as the UN to debate the usefulness of the treaty in the changed context of technological advancements and new geopolitical dynamics, and potentially find compromises where there are disagreements.

### Framing

#### I value morality

#### The standard is maximizing well-being, specifically act hedonism

#### 1] Pleasure and pain are constitutive

#### A]

Moen 15 (Moen, Martin, An argument for Hedonism, 15 //chskk)

The special value statuses of pleasure and pain are manifested in how we treat these experiences in our everyday reasoning about values. If you tell me that you are heading for the convenience store, I might ask: ‘‘What for?’’ This is a reasonable question, for when you go to the convenience store you usually do so, not merely for the sake of going to the convenience store, but for the sake of achieving something further that you deem to be valuable. You might answer, for example: ‘‘To buy soda.’’ This answer makes sense, for soda is a nice thing and you can get it at the convenience store. I might further inquire, however: ‘‘What is buying the soda good for?’’ This further question can also be a reasonable one, for it need not be obvious why you want the soda. You might answer: ‘‘Well, I want it for the pleasure of drinking it.’’ If I then proceed by asking ‘‘But what is the pleasure of drinking the soda good for?’’ the discussion is likely to reach an awkward end. The reason is that the pleasure is not good for anything further; it is simply that for which going to the convenience store and buying the soda is good.3 As Aristotle observes: ‘‘We never ask [a man] what his end is in being pleased, because we assume that pleasure is choice worthy in itself.’’4 Presumably, a similar story can be told in the case of pains, for if someone says ‘‘This is painful!’’ we never respond by asking: ‘‘And why is that a problem?’’ We take for granted that if something is painful, we have a sufficient explanation of why it is bad.

#### B] All other reasoning is circular; things are good or bad because they evoke pleasure or pain

#### 2] Extinction first

#### A]

#### Extinction is the worst impact under any framing: irreversibility, future generations, and moral uncertainty

MacAskill 14 (MacAskill, William, Oxford Philosopher and youngest tenured philosopher in the world, Normative Uncertainty, 2014//chskk)

The human race might go extinct from a number of causes: asteroids, supervolcanoes, runaway climate change, pandemics, nuclear war, and the development and use of dangerous new technologies such as synthetic biology, all pose risks (even if very small) to the continued survival of the human race.184 And different moral views give opposing answers to question of whether this would be a good or a bad thing. It might seem obvious that human extinction would be a very bad thing, both because of the loss of potential future lives, and because of the loss of the scientific and artistic progress that we would make in the future. But the issue is at least unclear. The continuation of the human race would be a mixed bag: inevitably, it would involve both upsides and downsides. And if one regards it as much more important to avoid bad things happening than to promote good things happening then one could plausibly regard human extinction as a good thing.For example, one might regard the prevention of bads as being in general more important that the promotion of goods, as defended historically by G. E. Moore,185 and more recently by Thomas Hurka.186 One could weigh the prevention of suffering as being much more important that the promotion of happiness. Or one could weight the prevention of objective bads, such as war and genocide, as being much more important than the promotion of objective goods, such as scientific and artistic progress. If the human race continues its future will inevitably involve suffering as well as happiness, and objective bads as well as objective goods. So, if one weights the bads sufficiently heavily against the goods, or if one is sufficiently pessimistic about humanity’s ability to achieve good outcomes, then one will regard human extinction as a good thing.187 However, even if we believe in a moral view according to which human extinction would be a good thing, we still have strong reason to prevent near-term human extinction. To see this, we must note three points. First, we should note that the extinction of the human race is an extremely high stakes moral issue. Humanity could be around for a very long time: if humans survive as long as the median mammal species, we will last another two million years. On this estimate, the number of humans in existence in the The future, given that we don’t go extinct any time soon, would be 2×10^14. So if it is good to bring new people into existence, then it’s very good to prevent human extinction. Second, human extinction is by its nature an irreversible scenario. If we continue to exist, then we always have the option of letting ourselves go extinct in the future (or, perhaps more realistically, of considerably reducing population size). But if we go extinct, then we can’t magically bring ourselves back into existence at a later date. Third, we should expect ourselves to progress, morally, over the next few centuries, as we have progressed in the past. So we should expect that in a few centuries’ time we will have better evidence about how to evaluate human extinction than we currently have. Given these three factors, it would be better to prevent the near-term extinction of the human race, even if we thought that the extinction of the human race would actually be a very good thing. To make this concrete, I’ll give the following simple but illustrative model. Suppose that we have 0.8 credence that it is a bad thing to produce new people, and 0.2 certain that it’s a good thing to produce new people; and the degree to which it is good to produce new people, if it is good, is the same as the degree to which it is bad to produce new people, if it is bad. That is, I’m supposing, for simplicity, that we know that one new life has one unit of value; we just don’t know whether that unit is positive or negative. And let’s use our estimate of 2×10^14 people who would exist in the future, if we avoid near-term human extinction. Given our stipulated credences, the expected benefit of letting the human race go extinct now would be (.8-.2)×(2×10^14) = 1.2×(10^14). Suppose that, if we let the human race continue and did research for 300 years, we would [to] know for certain whether or not additional people are of positive or negative value. If so, then with the credences above we should think it 80% likely that we will find out that it is a bad thing to produce new people, and 20% likely that we will find out that it’s a good thing to produce new people. So there’s an 80% chance of a loss of 3×(10^10) (because of the delay of letting the human race go extinct), the expected value of which is 2.4×(10^10). But there’s also a 20% chance of a gain of 2×(10^14), the expected value of which is 4×(10^13). That is, in expected value terms, the cost of waiting for a few hundred years is vanishingly small compared with the benefit of keeping one’s options open while one gains new information.

#### B] Math: Regardless of probability, extinction o/w; 1% of infinity is still infinity

#### 3] Actor Specificity

#### A] Policymakers only know aggregations and therefore can’t morally deliberate without being infinitely regressive

#### B] Other frameworks can’t be used to determine if the rez is moral if they are impossible to implement

#### 4] TJF’s

#### A] Frameworks must be theoretically justified because it leads to out of round terminal impacts like education

#### B] TJF’s come first because they’re a meta-constraint on your ability to run your framework

#### C] Accessibility: Util is accessible to novices because they’re familiar with consequential moral calculus- o/w on education because more people doing debate the more people gain education

#### D] Topic Research: Lit base grounded in empirics allows for wider ground and more clash which is key to education

#### 5] Lexical Prerequisite: A subject must be alive in order to engage in ethics- bodily security is a prior question to ethical theories

#### 6] Indicts don’t link

#### A] Aggregation works- that’s what impact calc is for, it’s a matter of weighing

#### B] Stemming consequences is false- we can calculate events in terms of experimental or theoretical probability- we can calculate 2+2 with 100% certainty

#### C] Induction works- We can predict the future based on the past with certainty

### UV

#### 1] I get 1AR theory- key to fairness

#### A] Without checks the 1NC can be infinitely abusive

#### B] Allows for reciprocity since the 1N gets theory

#### 2] 1AR theory is the highest layer of the debate

#### A] The 1AR is too short to cover substance and solve abuse

#### B] Uplayering 1AR shells with the NC makes it impossible to solve abuse

#### 3] Permissibility and presumption affirm

#### A] If we don’t assume statements to be true then we can’t start a strand of reasoning and knowledge would be impossible

#### B] We presume statements true more often than false- if I tell you my name is kyren you’d believe me

#### C] Affirming is harder- 4-6-3 time skew and ground disparity

#### D] Neg args presuppose the aff being true to indict it

#### E] Things are permissible until proven not- if the aff burden was to prove the plan permissible then subjects would need a proactive reason to take any action

#### Mining isn’t needed – efficient usage and alternatives check

Dodd 18 [(Jan, Wind Power Monthly magazine journalist) “Rethinking the use of rare-earth elements,” Wind Power Monthly, November 30, 2018, <https://www.windpowermonthly.com/article/1519221/rethinking-use-rare-earth-elements>] TDI

Technological innovation

Another response to rising prices is to use less. In the wake of 2011, as well as moving away from offering PSMGs onshore, turbine manufacturers also started improving material efficiency.

The main target has been to reduce the dysprosium content. The metal, which allows the permanent magnets to operate at high temperatures, is used in relatively small quantities, but is significantly more costly than neodymium.

SGRE, for example, has worked with its suppliers to reduce the amount of dysprosium to "significantly below 1%", the company says. Improvements were made not only in the composition of the magnet, but also in the generators’ cooling systems.

Goldwind too has been upgrading its direct-drive PMSG turbines. "Some of the permanent magnets used in Goldwind wind turbines now contain no dysprosium, while others contain less than 1%," Cao states.

The high-temperature superconductor (HTS) generators currently under development also require very small amounts of REEs.

The HTS being developed under the EU-funded EcoSwing research project uses "much less than 1kg of REEs" — largely Yttrium — per megawatt, says Jürgen Kellers, managing partner of engineering firm ECO5. The world’s first superconducting generator was installed in an Envision turbine in Denmark this autumn (below).

Others are aiming to eliminate rare earths altogether. UK-based GreenSpur Renewables is developing a multi- megawatt direct-drive generator using cheap and plentiful ferrite magnets.

These are about one third the strength of neodymium-iron-boron magnets, but GreenSpur’s unique axial design means the overall weight of the generator is approximately the same, says Alex Freeman, the company’s operations director.

Recycling

Industry and research bodies have also been looking at recycling permanent magnets. Goldwind is already doing so, smelting old magnets to make new ones, Cao says.

"Due to their large size and standardised model, the permanent magnets used in wind turbines can be recycled more easily than those used in other rare-earth permanent magnet products," he notes.