**OFF**

**1NC---New Affs Bad**

**Interp: Debaters must disclose affirmative advocacy texts and advantage areas thirty minutes before round if they haven’t read the aff before.**

**Violation: screenshots**

Graphical user interface, application

Description automatically generated

**Standards:**

**1] Clash- Not disclosing incentivizes surprise tactics and poorly refined positions that rely on artificial and vague negative engagement to win debates.**

**2] Shiftiness- Not knowing enough about the affirmative coming into round incentivizes 1ar shiftiness about what the aff is and what their framework/advocacy entails.**

## OFF

### 1NC---Space Col Good

#### Earth is dying

Arora 19 (Naveen Kumar Arora, Professor in the Department of Environmental Science, Ex-Head Department of Env. Microbiology, Babasaheb Bhimrao Ambedkar University.)(“Earth: 50 years challenge”, Environmental Sustainability, March 2019, Volume 2, [Issue 1](https://link.springer.com/journal/42398/2/1/page/1), pp 1–3)//ASMITH

The life of earth is estimated to be 4.54 billion years with an error range of 50 million years. Life appeared on earth around 3.5 billion years ago. Around 200,000 years ago, Homo sapiens evolved and started the great civilizations on the planet. Study suggests that human population is only 0.01% of all the life forms on Earth. This shows how existence of humans is just a miniscule part if we compare it with the existence of our planet or of the presence of life on earth. But if we go through the events particularly in last 10,000 years (of recorded history of mankind), it becomes clear that the presence of humans on earth brought several changes in both the biological and non-biological components. Most of the striking changes have appeared in last 50 years or so. According to reports, humans have destroyed about 83% of wild mammals and half the species of plants till date. On the whole, humans have consumed 30% of the known resources resulting into scarcer ecosystem services for future generations. If these trends continue, the Earth will soon be experiencing mass extinctions and we will be left with an even more degraded planet. Humans in last 50 years, because of ever-increasing population associated with pollution and destruction of natural ecosystems have completely changed the face of the Earth. The exponential increase in human population in last few decades brought about many drastic changes on Earth making it look much degraded and bruised. One such phenomenon is Earth’s present carbon dioxide (a potent green house gas) level in the atmosphere which has exceeded 411 parts per million (ppm), much higher as compared to about 323 ppm about 50 years ago, resulting in major environmental issues such as global warming and climate change. According to the Fifth Assessment Report of Intergovernmental Panel on Climate Change, anthropogenic activities have been described as the main cause of increased green house gases level, of which 2/3rd come from burning of fossil fuels and 1/3rd is from land use changes. The increased clearing of forests and vegetated lands, due to overgrazing and industrial transformation, in the 1970s showed disturbed albedo and evapotranspiration leading to warming of earth, change in carbon cycle and global catastrophic events of biodiversity extinction. NASA’s Goddard Institute for Space Studies (GISS) analyzed that the average global temperature of earth has increased by about 0.8 °C since 1880 and two-thirds of this warming has been reported since 1975. The nexus of responses and catastrophic events also point towards the accelerated rate of melting of glaciers with the loss of 226 gigatons/year of ice between 1971 and 2009. The highest impacted glacier loss was reported from Greenland Ice Sheet (about sixfold higher) and Antarctic ice (almost quadrupled) in merely 20 years. Correspondingly, the sea level rise has almost doubled in last 20 years, with increment being 3.1 mm/year since 1993. Chemical and pesticide pollution is another menace to the ecosystems. According to reports, more than 1,40,000 chemicals including pesticides, plastics, etc. have been synthesized till date since 1950 and each year 10 millions tons of toxic compounds are being dumped into the environment leading to land degradation, soil salinization and contamination of water resources. This has resulted in the problem of safe drinking water around the globe. As per reports of CNN, about 500 million tons of heavy metals, toxic sludge and hazardous solvents were estimated to be released in global water supply in 2007 making it unsafe to consume. Plastic pollution is also a big nuisance caused by humans on Earth. The stats show that annual production of plastics during 1970s was about 50 million metric tons and it has increased to over 348 million metric tons at present. In terms of biodiversity losses, WWF’s Living Planet Report highlights that humans have eradicated 60% of the Earth’s wildlife in less than 50 years. About 20% of Amazon forests are lost in the last half century. A recent study revealed that of total global tree cover loss between 2001 and 2015, 27% depreciation came from commodity driven deforestation i.e. conversion of forests permanently in order to expand commodities such as meat, minerals, oils and gas. Other drivers are forestry i.e. loss within the managed forests or tree plantations (26%), shifting agricultural practices (24%), wildfires (23%), and urbanization (0.6%). Half of the shallow-water corals have also been leached out by anthropogenic activities polluting the oceans and seas in last 30 years. The recent analysis shows that the population of freshwater animals has plummeted by 75% since 1970s. Reports say that the damage done is so rapid that even if we end it now, it will take centuries to replenish the natural world. The global human footprints over the past 50 years are so dominating that even the view of the planet from space shows the modification of various critical ecosystems and the demography. The complementing series of aerial pictures taken through satellites show that many hotspot ecosystems and areas have been tremendously degraded. Focusing on what all we have lost over the past half century, the red list is so long that it cannot be confined in few pages. The Great Barrier Reef visible even from space has shown 50% loss due to severe bleaching by increased temperature of the oceans in just 30 years and is predicted that up to 90% may die within next century. Shrinking of the Dead Sea has shown an alarming rate of around four feet a year and the sea has already lost one-third of its surface area. The increasing temperature has caused high rate of snow melting in the European mountain range The Alps, and the most unsettling event reported in 2017 was that the winter season was 38 days shorter in comparison to that in 1960. The human oriented massive irrigation project over past 50 years has shrunk the fourth largest lake Aral Sea, to only 10% and it will soon be a thing of the past. NASA’s monitoring of Arctic Sea ice since 1978 have detected a steep decline in overall ice content. The polar ice thawing stories over the past half centuries have been highly alarming and Antarctic alone has lost 40 billion tons of ice each year from 1979 to 1989 and this trend rose to 252 billion tons per year in 2009 and today Antarctic has already lost 6 times the ice it had 40 years ago. The ‘Third Pole’ i.e. The Himalayan- Hindu Kush mountain range and the Tibetan Plateau in Central Asia is also impacted by the negative trends of global warming and in the past 50 years this remote region has lost 509 glaciers resulting in the local temperature rise by 1.5 °C. Recently in 2018, a huge chunk of ice in Helheim Glacier in Greenland, about the size of Manhattan, with 10 billion tons of ice, split out and tumbled into sea; this loss was indicated as the most disturbing irreversible loss. The record breaking heat waves in Australia and Europe are already the hard and fast evidences to how much humans have changed the face of Earth. Australia witnessed the hottest summer in the recorded history in the year 2018–2019. The high melting of glaciers and warming of the poles led to the extreme freezing of Chicago, which became colder than Mount Everest, Siberia and the poles. The summers in Iran shockingly changed the size and color of Lake Urmia from green to brown due to blooming of algae and bacteria. Similarly, there are numerous reports which show the decline of fertile lands, increased soil salinity, loss of forests and so on, clearly visible by the satellite images. A team of researchers’ from several countries including Sweden, Australia, Denmark, USA, England, Canada, Germany and Holland declared climate change and biodiversity loss as the “core boundaries” which if breached can transform Earth to inhabitable state. Stephen Hawking in his recently published book “Brief Answers to the Big Questions” stated that the biggest threat to mankind on Earth is the human induced climate change. Although the technology has advanced at an unprecedented rate and this has improved the living standards a lot but the cost of this development in terms of damage to the planet as a whole is also extraordinary. We share the planet with millions of other species but have almost single handedly exploited it to the extent that every specie is affected one way or the other. The industrial, agricultural and the infrastructural revolution have resulted in over exploitation of resources and pollution of every nook and corner of the planet. The technologies which were developed to adorn and ease our routines has brought antonymic effect threatening the survival and has made it very clear that no human science can replace “nature’s perfect systems” which have been carving the environment and ecosystems of earth to balance it in the zone of habitability.

#### Space colonization is key to ensure human survival – pursuing it as soon as possible is crucial

Kovic 18 (Marko Kovic, co-founder and president of the thinktank [ZIPAR](https://kovic.ch/zipar/), the Zurich Institute of Public Affairs Research. He is also co-founder and CEO of the consulting firm [ars cognitionis](https://kovic.ch/consulting-ars-cognitionis/),. He has a PhD in political communication, University of Zurich.)(“Why space colonization is so important”, Nov 10, 2018, https://medium.com/@marko\_kovic/space-colonization-why-nothing-else-matters-a877723f77d4)//ASMITH

Should humankind exist in the future? Should the future existence of humankind be as good as possible in as many ways as possible? If your answer to these two questions is Yes, then there is a topic that you should care about a lot: Space colonization. Why, you might wonder, does space colonization matter, possibly more than anything else, as the title of this article claims? Because the future of humankind directly and completely dependent on whether and how we manage to colonize space. Space colonization is a double-edged sword. On one hand, the creation of permanent and self-sustainable human habitats beyond Earth is unavoidable if humankind is to exist in the long-term future. On the other hand, however, space colonization could bring about a catastrophically bad future if we colonize space in a bad way. That future that might be worse than one in which humankind does not exist. Space or bust: Why we must reach for the stars Why should we pursue space colonization in the first place? Don’t we have more pressing problems today, on Earth? Yes, we do have many problems on Earth today, and we should try to solve them. But space colonization is just that: A strategy for dealing with certain problems. An the problems that space colonization would be dealing with are, arguably, among the greatest problems of them all: Existential risks; risks that might lead to the extinction of humankind [1]. Currently, all of our proverbial existential eggs are in the same basket. If a natural existential risk strikes (for example, a large asteroid colliding with Earth) or if a man-made existential risk results in a catastrophic outcome (for example, runaway global warming [2, 3]), all of humankind is at risk because humankind is currently limited to planet Earth. If, however, there are self-sustainable human habitats beyond Earth, then the probability of an irreversibly catastrophic outcome for all of humankind is drastically reduced. Investing in space colonization today could therefore have immense future benefits. Using resources today in order to make space colonization possible in the medium-term future is not a waste, but a very profitable investment. If humankind stays limited to Earth and if we go extinct as a consequence of doing so, then we will all the billions of life years and billions of humans who might have come to exist — and who would have experienced happiness and contributed to humankind’s continued epistemic and moral progress. Taking space colonization more seriously today does not, of course, mean that we should only pursue space colonization and ignore everything else that is bad in the world. We should continue dealing with current global problems and, at the same time, invest greater resources into space colonization. At this point in our history and our technological development, even modest amounts of resources directed at space colonization would go a long way, such as public funding of basic research. Additionally, it is very likely that technological advances in the domain of space colonization would improve our lives in other ways as well thanks to technology transfer [4] — investing in space colonization today would probably be a win-win situation.

#### Only Getting off the Rock solves Existential Impacts.

Collins 10 [Patrick Collins, \*Professor of Life & Environmental Science at Azabu University & Systems Engineer at Andromeda Inc., Italy, and Adriano Autino, Expert in the economics of energy supply from space, “What the growth of a space tourism industry could contribute to employment, economic growth, environmental protection, education, culture and world peace,” *Acta Astronautica* 66 (2010) 1553–1562]

7.2. High return in safety from extra-terrestrial settlement Investment in low-cost orbital access and other space infrastructure will facilitate the establishment of settlements on the Moon, Mars, asteroids and in man-made space structures. In the first phase, development of new regulatory infrastructure in various Earth orbits, including property/usufruct rights, real estate, mortgage financing and insurance, traffic management, pilotage, policing and other services will enable the population living in Earth orbits to grow very large. Such activities aimed at making near-Earth space habitable are the logical extension of humans’ historical spread over the surface of the Earth. As trade spreads through near-Earth space, settlements are likely to follow, of which the inhabitants will add to the wealth of different cultures which humans have created in the many different environments in which they live. Success of such extra-terrestrial settlements will have the additional benefit of **reducing** the danger of human extinction due to planet-wide or cosmic accidents [27]. These horrors include both man-made disasters such as nuclear war, plagues or growing pollution, and natural disasters such as super-volcanoes or asteroid impact. It is hard to think of any objective that is more important than preserving peace. Weapons developed in recent decades are so destructive, and have such horrific, long-term side- effects that their use should be discouraged as strongly as possible by the international community. Hence, reducing the incentive to use these weapons by rapidly developing the ability to use space-based resources on a large scale is surely equally important [11,16]. The achievement ofthisdepends on low space travel costswhich, at the present time, appear to be achievable only through the development of a vigorous space tourism industry. 8. Summary. As discussed above, if space travel services had started during the 1950s, the space industry would be enor- mously more developed than it is today. Hence the failure to develop passenger space travel has seriously distorted the path taken by humans’ technological and economic development since WW2, away from the path which would have been followed if capitalism and democracy operated as intended. Technological know-how which could have been used to supply services which are known to be very popular with a large proportion of the population has not been used for that purpose, while waste and suffering due to the unemployment and environmental damage caused by the resulting lack of new industrial opportunities have increased. In response, policies should be implemented urgently to correct this error, and to catch up with the possibilities for industrial and economic growth that have been ignored for so long. This policy renewal is urgent because of the growing dangers of unemployment, economic stagnation, environmental pollution, educational and cultural decline, resource wars and loss of civil liberties which face civilisation today. In order to achieve the necessary progress there is a particular need for collaboration between those working in the two fields of civil aviation and civil space. Although the word ‘‘aerospace’’ is widely used, it is largely a misnomer since these two fields are in practice quite separate. True ‘‘aerospace’’ collaboration to realise passenger space travel will develop the wonderful profusion of possibilities outlined above. 8.1. Heaven or hell on Earth? As discussed above, the claim that the Earth’s resources are running out is used to justify wars which may never end: present-day rhetoric about ‘‘the long war’ ’or ‘‘100 years war’’ in Iraq and Afghanistan are current examples. If political leaders do not change their viewpoint, the recent aggression by the rich ‘‘Anglo-Saxon’’ countries, and their cutting back of traditional civil liberties, are ominous for the future. However, this ‘‘hellish’’ vision of endless war is based on an assumption about a single number—the future cost of travel to orbit—about which a different assumption leads to a ‘‘heavenly’’ vision of peace and ever-rising living standards for everyone. If this cost stays above 10,000 Euros/kg, where it has been unchanged for nearly 50years, the prospects for humanity are bleak. But if humans make the necessary effort, and use the tiny amount of resources needed to develop vehicles for passengers space travel, then this cost will fall to 100 Euros/kg, the use of extra-terrestrial resources will become economic, and arguments forresource wars will evaporate **entirely**. The main reason why this has not yet happened seems to be lack of understanding of the myriad opportunities by investors and policy-makers. Now that the potential to catch up half a century of delay in the growth of space travel is becoming understood, continuing to spend 20 billion Euro-equivalents/year on government space activities, while continuing to invest nothing in developing passenger space travel, would be a gross failure of economic policy, and strongly contrary to the economic and social interests of the public. Correcting this error, even after such a costly delay, will ameliorate many problems in the world today. As this policy error is corrected, and investment in profitable space projects grows rapidly in coming years, we can look forward to a growing world-wide boom. Viewed as a whole, humans’ industrial activities have been seriously underperforming for decades, due to the failure to exploit these immensely promising fields of activity. The tens of thousands of unemployed space engineers in Russia, America and Europe alone are a huge waste. The potential manpower in rapidly developing India and China is clearly vast. The hundreds of millions of disappointed young people who have been taught that they cannot travel in space are another enormous wasted resource.

#### Every second of delayed colonization kills 10^29 potential human lives

Bostrom 3 Nick Bostrom, philosopher at the University of Oxford, a Ph.D. degree in philosophy from the London School of Economics, and was a British Academy Postdoctoral Fellow at the University of Oxford, 2003, “Astronomical Waste: The Opportunity Cost of Delayed Technological Development”, Utilitas Vol. 15, No. 3, <https://nickbostrom.com/astronomical/waste.html#_edn8>, EO

As I write these words, suns are illuminating and heating empty rooms, unused energy is being flushed down black holes, and our great common endowment of negentropy is being irreversibly degraded into entropy on a cosmic scale. These are resources that an advanced civilization could have used to create value-structures, such as sentient beings living worthwhile lives.

The rate of this loss boggles the mind. One recent paper speculates, using loose theoretical considerations based on the rate of increase of entropy, that the loss of potential human lives in our own galactic supercluster is at least ~10^46 per century of delayed colonization.[1] This estimate assumes that all the lost entropy could have been used for productive purposes, although no currently known technological mechanisms are even remotely capable of doing that. Since the estimate is meant to be a lower bound, this radically unconservative assumption is undesirable.

We can, however, get a lower bound more straightforwardly by simply counting the number or stars in our galactic supercluster and multiplying this number with the amount of computing power that the resources of each star could be used to generate using technologies for whose feasibility a strong case has already been made. We can then divide this total with the estimated amount of computing power needed to simulate one human life.

As a rough approximation, let us say the Virgo Supercluster contains 10^13 stars. One estimate of the computing power extractable from a star and with an associated planet-sized computational structure, using advanced molecular nanotechnology[2], is 10^42 operations per second.[3] A typical estimate of the human brain’s processing power is roughly 10^17 operations per second or less.[4] Not much more seems to be needed to simulate the relevant parts of the environment in sufficient detail to enable the simulated minds to have experiences indistinguishable from typical current human experiences.[5] Given these estimates, it follows that the potential for approximately 10^38 human lives is lost every century that colonization of our local supercluster is delayed; or equivalently, about 10^29 potential human lives per second.

While this estimate is conservative in that it assumes only computational mechanisms whose implementation has been at least outlined in the literature, it is useful to have an even more conservative estimate that does not assume a non-biological instantiation of the potential persons. Suppose that about 10^10 biological humans could be sustained around an average star. Then the Virgo Supercluster could contain 10^23 biological humans. This corresponds to a loss of potential equal to about 10^14 potential human lives per second of delayed colonization.

What matters for present purposes is not the exact numbers but the fact that they are huge. Even with the most conservative estimate, assuming a biological implementation of all persons, the potential for one hundred trillion potential human beings is lost for every second of postponement of colonization of our supercluster.[6]

II. THE OPPORTUNITY COST OF DELAYED COLONIZATION

From a utilitarian perspective, this huge loss of potential human lives constitutes a correspondingly huge loss of potential value. I am assuming here that the human lives that could have been created would have been worthwhile ones. Since it is commonly supposed that even current human lives are typically worthwhile, this is a weak assumption. Any civilization advanced enough to colonize the local supercluster would likely also have the ability to establish at least the minimally favorable conditions required for future lives to be worth living.

The effect on total value, then, seems greater for actions that accelerate technological development than for practically any other possible action. Advancing technology (or its enabling factors, such as economic productivity) even by such a tiny amount that it leads to colonization of the local supercluster just one second earlier than would otherwise have happened amounts to bringing about more than 10^29 human lives (or 10^14 human lives if we use the most conservative lower bound) that would not otherwise have existed. Few other philanthropic causes could hope to match that level of utilitarian payoff.

#### Try-or-die for space exploration

Ben Austen 11, citing the Lifeboat Foundation and the Alliance to Rescue Civilization, contributing editor of Harper’s Magazine, “After Earth: Why, Where, How, and When We Might Leave Our Home Planet,” popular science, http://www.popsci.com/science/article/2011-02/after-earth-why-where-how-and-when-we-might-leave-our-home-planet?page=3

Earth won’t always be fit for occupation. We know that in two billion years or so, an expanding sun will boil away our oceans, leav[e]ing our home in the universe uninhabitable—unless, that is, we haven’t already been wiped out by the Andromeda galaxy, which is on a multibillion-year collision course with our Milky Way. Moreover, at least a third of the thousand mile-wide asteroids that hurtle across our orbital path will eventually crash into us, at a rate of about one every 300,000 years. Why? Indeed, in 1989 a far smaller asteroid, the impact of which would still have been equivalent in force to 1,000 nuclear bombs, crossed our orbit just six hours after Earth had passed. A recent report by the Lifeboat Foundation, whose hundreds of researchers track a dozen different existential risks to humanity, likens that one-in-300,000 chance of a catastrophic strike to a game of Russian roulette: “If we keep pulling the trigger long enough we’ll blow our head off, and there’s no guarantee it won’t be the next pull.” Many of the threats that might lead us to consider off-Earth living arrangements are actually man-made, and not necessarily in the distant future. The amount we consume each year already far outstrips what our planet can sustain, and the World Wildlife Fund estimates that by 2030 we will be consuming two planets’ worth of natural resources annually. The Center for Research on the Epidemiology of Disasters, an international humanitarian organization, reports that the onslaught of droughts, earthquakes, epic rains and floods over the past decade is triple the number from the 1980s and nearly 54 times that of 1901, when this data was first collected. Some scenarios have climate change leading to severe water shortages, the submersion of coastal areas, and widespread famine. Additionally, the world could end by way of deadly pathogen, nuclear war or, as the Lifeboat Foundation warns, the “misuse of increasingly powerful technologies.” Given the risks humans pose to the planet, we might also someday leave Earth simply to conserve it, with our planet becoming a kind of nature sanctuary that we visit now and again, as we might Yosemite. None of the threats we face are especially far-fetched. Climate change is already a major factor in human affairs, for instance, and our planet has undergone at least one previous mass extinction as a result of asteroid impact. “The dinosaurs died out because they were too stupid to build an adequate spacefaring civilization,” says Tihamer Toth-Fejel, a research engineer at the Advanced Information Systems division of defense contractor General Dynamics and one of 85 members of the Lifeboat Foundation’s space-settlement board. “So far, the difference between us and them is barely measurable.” The Alliance to Rescue Civilization, a project started by New York University chemist Robert Shapiro, contends that the inevitability of any of several cataclysmic events means that we must prepare a copy of our civilization and move it into outer space and out of harm’s way—a backup of our cultural achievements and traditions. In 2005, then–NASA administrator Michael Griffin described the aims of the national space program in similar terms. “If we humans want to survive for hundreds of thousands or millions of years, we must ultimately populate other planets,” he said. “One day, I don’t know when that day is, but there will be more human beings who live off the Earth than on it.

#### Mars colonization is possible and way better than moon colonization – resources, power generation, and more

#### Technology to colonize Mars will improve life on Earth

Orwig 15**,**(Jessica Orwig has a Master of Science in science and technology journalism from Texas A&M University and a Bachelor of Science in astronomy and physics,5 Undeniable Reasons why Humans Should Go To Mars, <http://www.businessinsider.com/5-undeniable-reasons-why-humans-should-go-to-mars-2015-4>, 04/21/2015)

3. Improving the quality of life on Earth "Only by pushing mankind to its limits, to the bottoms of the ocean and into space, will we make discoveries in science and technology that can be adapted to improve life on Earth." British doctor Alexander Kumar wrote that in a 2012 article for BBC News where he explored the pros and cons of sending humans to Mars. At the time, Kumar was living in the most Mars-like place on Earth, Antarctica, to test how he adapted to the extreme conditions both physiologically and psychologically. To better understand his poignant remark, let's look at an example: During its first three years in space, NASA's prized Hubble Space Telescope snapped blurry pictures because of a flaw in its engineering. The problem was fixed in 1993, but to try to make use of the blurry images during those initial years, astronomers developed a computer algorithm to better extract information from the images. It turns out the algorithm was eventually shared with a medical doctor who applied it to the X-ray images he was taking to detect breast cancer. The algorithm did a better job at detecting early stages of breast cancer than the conventional method, which at the time was the naked eye. "You can't script that. That happens all the time — this cross pollination of fields, innovation in one, stimulating revolutionary changes in another," Tyson, the StarTalk radio host, explained during an interview with Fareed Zakaria in 2012. It's impossible to predict how cutting-edge technologies used to develop manned missions to Mars and habitats on Mars will benefit other fields like medicine or agriculture. But we'll figure that out only by "pushing humankind to its limits" and boldy going where we've never been before.

#### Space Exploration for Colonization spills down to Green Tech.

Mascaro 14

Joseph Mascaro is a writer, Ph. D. Ecologist, and Science and Technology Policy Fellow at the American Association for the Advancement of Science, The Space Review, January 13, 2014, “Why greens should be pro-space”, <http://www.thespacereview.com/article/2433/1>

Next, the article seems to imply that high-powered space enthusiasts are just in it for the joy riding. But, by their own account, they’re simply trying to create a viable private industry, of which tourism is one small piece. These pro-space moneybags are also up to their eyebrows in green tech. Consider that Branson and his competitors are among the most active innovators of green technologies in the world. SpaceX chief Elon Musk is also an electric car kingpin and solar panel installer extraordinaire at the helm of Tesla and Solar City, respectively. Planetary Resources co-founder Peter Diamandis has led the X PRIZE Foundation to support competitions for high-efficiency cars. Clearly, the key players in the industry believe that space exploration and saving the Earth are not contradictory goals.

On the long view, it is rather surprising that a visionary organization like Breakthrough doesn’t seem to agree. A viable private space industry would be a boon for green technology—producing innovations right in Breakthrough’s wheelhouse. Space systems rely on low-carbon power sources like nuclear and solar; they employ fuel cells and advanced batteries. The viability of the nascent industry is almost wholly dependent on increasing efficiencies and lowering costs—and that means advanced manufacturing systems like 3-D metal printers and reusable rocket stages. Ultimately, having humans living and working in space and in Martian outposts means building closed-loop ecosystems and developing new methods of agriculture and resource sustainability.

All of these technologies will have immediate and dramatic effects at home. Consider efforts to draw down carbon dioxide on Earth, such as those in carbon capture and sequestration. These would benefit immediately from a humans-to-Mars mission like Zubrin’s “Mars Direct,” which uses a well-demonstrated method for extracting carbon dioxide from of the Martian atmosphere to make oxygen for fuel. Even brute-force rocket innovations are going to help: SpaceX has invested untold millions to make rocket stages reusable, particularly high-carbon-footprint components like engines. All reports suggest they are at the cusp of a true, ahem, breakthrough that will cause carbon budgets of regular space launches to plummet.

Perhaps trumping these tangible spinoffs, though, is the collective benefit we get from living in a culture of innovation. The Apollo missions infused our culture with what astrophysicist Neil deGrasse Tyson calls the “dreams of tomorrow.” Kids grew up wanting to be astronauts and then switched gears to be cancer biologists or child developmental psychologists or climatologists. Breakthrough Institute founders Michael Schellenberger and Ted Nordhaus recognized the power of this culture of innovation when they named their energy independence plan “Apollo II.”

Today, Branson, Musk and others are burning a tad more than their fair share of carbon trying to build a new space industry. But devolving into carbon accounting misses the big picture: innovations from the new space race will help save the Earth.

#### Space Colonization leads to Space Mining development.

## OFF

### 1NC---Deterrence DA

#### Space exploration and colonization is key to Space Deterrence – Commercial Flexibility is key to deterrence by denial.

Klein 19, John J. Understanding space strategy: the art of war in space. Routledge, 2019. (a Senior Fellow and Strategist at Falcon Research, Inc. and Adjunct Professor at George Washington University’s Space Policy Institute)//Elmer

Recent U.S. space policy initiatives underscore the far-reaching benefits of commercial space activities. The White House revived the National Space Council to foster closer coordination, cooperation, and exchange of technology and information among the civil, national security, and commercial space sectors.1 National Space Policy Directive 2 seeks to promote economic growth by streamlining U.S. regulations on the commercial use of space.2 While the defense community generally appreciates the value of services and capabilities derived from the commercial space sector—including space launch, Earth observation, and satellite communications—it often overlooks one area of strategic importance: deterrence. To address the current shortcoming in understanding, this paper first describes the concept of deterrence, along with how space mission assurance and resilience fit into the framework. After explaining how commercial space capabilities may influence the decision calculus of potential adversaries, this study presents actionable recommendations for the U.S. Department of Defense (DoD) to address current problem areas. Ultimately, DoD—including the soon-to-be reestablished U.S. Space Command and possibly a new U.S. Space Force—should incorporate the benefits and capabilities of the commercial space sector into flexible deterrent options and applicable campaign and contingency plans. Deterrence, Mission Assurance, and Resilience Thomas Schelling, the dean of modern deterrence theory, held that deterrence refers to persuading a potential enemy that it is in its interest to avoid certain courses of activity.3 One component of deterrence theory lies in an understanding that the threat of credible and potentially overwhelming force or other retaliatory action against any would-be adversary is sufficient to deter most potential aggressors from conducting hostile actions. This idea is also referred to as deterrence by punishment.4 The second salient component of deterrence theory is denial. According to Glenn Snyder’s definition, deterrence by denial is “the capability to deny the other party any gains from the move which is to be deterred.”5 The 2018 U.S. National Defense Strategy (NDS) highlights deterrence, and specifically deterrence by denial, as a vital component of national security. The NDS notes that the primary objectives of the United States include deterring adversaries from pursuing aggression and preventing hostile actions against vital U.S. interests.6 The strategy also observes that deterring conflict necessitates preparing for war during peacetime.7 For the space domain, the peacetime preparedness needed for deterrence by denial occurs in the context of space mission assurance and resilience. Mission assurance entails “a process to protect or ensure the continued function and resilience of capabilities and assets—including personnel, equipment, facilities, networks, information and information systems, infrastructure, and supply chains—critical to the performance of DoD mission essential functions in any operating environment or condition.”8 Similar to mission assurance but with a different focus, resilience is an architecture’s ability to support mission success with higher probability; shorter periods of reduced capability; and across a wider range of scenarios, conditions, and threats, despite hostile action or adverse conditions.9 Resilience may leverage cross-domain solutions, along with commercial and international capabilities.10 Space mission assurance and resilience can prevent a potential adversary from achieving its objectives or realizing any benefit from its aggressive action. These facets of U.S. preparedness help convey the futility of conducting a hostile act. Consequently, they enhance deterrence by denial. Commercial Space Enables Deterrence The commercial space sector directly promotes mission assurance and resilience efforts. This is in part due to the distributed and diversified nature of commercial space launch and satellites services. Distribution refers to the use of a number of nodes, working together, to perform the same mission or functions as a single node; diversification describes contributing to the same mission in multiple ways, using different platforms, orbits, or systems and capabilities.11 The 2017 U.S. National Security Strategy, in noting the benefits derived from the commercial space industry, states that DoD partners with the commercial sector’s capabilities to improve the U.S. space architecture’s resilience.12 Although U.S. policy and joint doctrine frequently acknowledge the role of the commercial space sector in space mission assurance and resilience, there is little recognition that day-to-day contributions from the commercial industry assists in deterring would-be adversaries. The commercial space sector contributes to deterrence by denial through multi-domain solutions that are distributed and diversified. These can deter potential adversaries from pursuing offensive actions against space-related systems. Commercial launch providers enhance deterrence by providing options for getting payloads into orbit. These include diverse space launch capabilities such as small and responsive launch vehicles, along with larger, reusable launch vehicles; launch rideshares for secondary payloads; and government payloads on commercial satellites. Various on-orbit systems also promote deterrence. For example, if an aggressor damages a commercial remote sensing satellite during hostilities, similar commercial satellites in a different orbital regime, or those of the same constellation, may provide the needed imagery. If satellite communications are jammed or degraded, commercial service providers can reroute satellite communications through their own networks, or potentially through the networks of another company using a different portion of the frequency spectrum. Regarding deterrence by punishment efforts, the commercial space sector can play a role, albeit an indirect one, through improved space situational awareness (SSA) and space forensics (including digital forensics and multispectral imagery). The commercial industry may support the attribution process following a hostile or illegal act in space through its increasingly proliferating network of SSA ground telescopes and other terrestrial tracking systems. The DoD may also leverage the commercial space sector’s cyber expertise to support digital forensic efforts to help determine the source of an attack. By supporting a credible and transparent attribution process, commercial partners may cause a would-be adversary to act differently if it perceives that its aggressive, illegal, or otherwise nefarious actions will be disclosed. Doing so can help bolster the perceived ability to conduct a legitimate response following a hostile attack, which may improve deterrence by punishment efforts. Commercial space capabilities may also facilitate the application of force to punish a potential aggressor. In addition to traditional military space systems, commercial satellite imagery and communication capabilities may be used in cueing and targeting for punitive strikes against an aggressor. Although the commercial space sector is not expected to be involved directly in the use of retaliatory force following a hostile act, commercial partners may help in providing the information used to identify those responsible and to facilitate any consequent targeting efforts.

#### Space Deterrence Breakdowns causes War and Extinction.

Parker 17 Clifton Parker 1-24-2017 “Deterrence in space key to U.S. security” <https://cisac.fsi.stanford.edu/news/deterrence-space-key-us-security> (Policy Analyst at the Stanford Center for International Security and Cooperation)//Elmer

Space is more important than ever for the security of the United States, but it’s almost like the Wild West in terms of behavior, a top general said today. Air Force Gen. [John Hyten](http://www.af.mil/AboutUs/Biographies/Display/tabid/225/Article/108115/general-john-e-hyten.aspx), commander of the U.S. Strategic Command, spoke Jan. 24 at Stanford’s [Center](http://cisac.fsi.stanford.edu/) for International Security and Cooperation. His [talk](http://cisac.fsi.stanford.edu/events/us-strategic-command-perspectives-deterrence-and-assurance) was titled, “U.S. Strategic Command Perspectives on Deterrence and Assurance.” Hyten said, “Space is fundamental to every single military operation that occurs on the planet today.” He added that “there is no such thing as a war in space,” because it would affect all realms of human existence, due to the satellite systems. Hyten advocates “strategic deterrence” and “norms of behavior” across space as well as land, water and cyberspace. Otherwise, rivals like China and Russia will only threaten U.S. interests in space and wreak havoc for humanity below, he said. Most of contemporary life depends on systems connected to space. Hyten also addressed other topics, including recent proposals by some to upgrade the country’s missile defense systems. “You just don’t snap your fingers and build a state-of-the-art anything overnight,” Hyten said, adding that he has not yet spoken to Trump administration officials about the issue. “We need a powerful military,” but a severe budget crunch makes “reasonable solutions” more likely than expensive and unrealistic ones. On the upgrade front, Hyten said he favors a long-range strike missile system to replace existing cruise missiles; a better air-to-air missile for the Air Force; and an improved missile defense ground base interceptor. ‘Critically dependent’ From satellites to global-positioning systems GPS, space has transformed human life – and the military – in the 21st century, Hyten said. In terms of defining "space," the U.S. designates people who travel above an altitude of 50 miles as astronauts. As the commander of the U.S. Strategic Command, Hyten oversees the control of U.S. strategic forces, providing options for the president and secretary of defense. In particular, this command is charged with space operations (such as military satellites), information operations (such as information warfare), missile defense, global command and control, intelligence, surveillance, and reconnaissance, global strike and strategic deterrence (the U.S. nuclear arsenal), and combating weapons of mass destruction. Hyten explained that every drone, fighter jet, bomber, ship and soldier is critically dependent on space to conduct their own operations. All cell phones use space, and the GPS command systems overall are managed at Strategic Command, he said. “No soldier has to worry about what’s over the next hill,” he said, describing GPS capabilities, which have fundamentally transformed humanity’s way of life. Space needs to be available for exploration, he said. “I watch what goes on in space, and I worry about us destroying that environment for future generations.” He said that too many drifting objects and debris exist – about 22,000 right now. A recent Chinese satellite interception created a couple thousand more debris objects that now circle about the Earth at various altitudes and pose the risk of striking satellites. “We track every object in space” now, Hyten said, urging “international norms of behavior in space.” He added, “We have to deter bad behavior on space. We have to deter war in space. It’s bad for everybody. We could trash that forever.” But now rivals like China and Russia are building weapons to deploy in the lower levels of space. “How do we prevent this? It’s bigger than a space problem,” he said. Deterring conflict in the cyber, nuclear and space realms is the strategic deterrence goal of the 21st century, Hyten said. “The best way to prevent war is to be prepared for war,” he said. Hyten believes the U.S. needs a fundamentally different debate about deterrence. And it all starts with nuclear weapons. “In my deepest heart, I wish I didn’t have to worry about nuclear weapons,” he said. Hyten described his job as “pretty sobering, it’s not easy.” But he also noted the mass violence of the world prior to 1945 when the first atomic bomb was used. Roughly 80 million people died from 1939 to 1945 during World War II. Consider that in the 10-plus years of the Vietnam War, 58,000 Americans were killed. That’s equivalent to two days of deaths in WWII, he said. In a world without nuclear weapons, a rise in conventional warfare would produce great numbers of mass casualties, Hyten said. About war, he said, “Once you see it up close, no human will ever want to experience it.” Though America has “crazy enemies” right now, in many ways the world is more safe than during WWII, Hyten said. The irony is that nuclear weapons deterrence has kept us from the type of mass killings known in events like WWII. But the U.S. must know how to use its nuclear deterrence effectively. Looking ahead, Hyten said the U.S. needs to think about space as a potential war environment. An attack in space might not mean a response in space, but on the Earth. Hyten describes space as the domain that people look up at it and still dream about. “I love to look at the stars,” but said he wants to make sure he’s not looking up at junk orbiting in the atmosphere.

## ADV

### 1NC---Alt Cause

#### The Moon is an alt cause to every Impact in this Aff – their ev may say the word “Mars” but all of the I/Ls are predicated on Colonization being bad – Private Companies are colonizing the Moon which means Zero Case.

Bort 19 Julie Bort 6-6-2019 "Jeff Bezos explains why he's trying to colonize the moon: 'We need to go to the moon to save the Earth" <https://archive.is/UcWor> (Business Correspondent at Business Insider)//Elmer

Amazon CEO Jeff Bezos says there's a very simple reason his other company, Blue Origin, is working on a giant lunar lander to make moon travel as easy as an airplane flight: Humanity's very survival relies on colonizing space, starting with the moon. So he told attendees during his time on stage Thursday at Amazon's inaugural Re:Mars tech conference taking place this week in Las Vegas. He was interviewed by Jenny Freshwater, the director of Amazon forecasting and capacity planning. Last month, Bezos unveiled the lunar-lander vehicle, called Blue Moon, designed to deliver a variety of payloads to the moon with the ultimate goal of helping humans establish a "sustained human presence" there. Bezos said that using the moon is all part of his plan to save humanity by helping build the infrastructure necessary for space colonization. "The reason we've got to go to space, in my view, is to save the Earth," he said on Thursday. "If we're going to continue to grow this civilization, we need to move — and I'm talking about something our grandchildren will work on and their grandchildren and so on. This isn't something just this generation is going to accomplish."

### ---Cap Good

#### 1---Cap sustainable---profit motive drives tech innovation and makes resources infinite---only way to solve environmental collapse and extinction.

McAfee 19—cofounder and codirector of the MIT Initiative on the Digital Economy at the MIT Sloan School of Management, former professor at Harvard Business School and fellow at Harvard’s Berkman Center for Internet and Society (Andrew, “Looking Ahead: The World Cleanses Itself This Way,” *More from Less: The Surprising Story of How We Learned to Prosper Using Fewer Resources—and What Happens Next*, Chapter 14, pg 278-292, Kindle, dml)

As today’s poor countries get richer, their institutions will improve and most will eventually go through what Ricardo Hausmann calls "the capitalist makeover of production." This makeover doesn't enslave people, nor does it befoul the earth. As today’s poor get richer, they'll consume more, but they'll also consume much differently from earlier generations. They won't read physical newspapers and magazines. They'll get a great deal of their power from renewables and (one hopes) nuclear because these energy sources will be the cheapest. They’ll live in cities, as we saw in chapter 12; in fact, they already are. They'll be less likely to own cars because a variety of transportation options will be only a few taps away. Most important, they'll come up with ideas that keep the growth going, and that benefit both humanity and the planet we live on. Predicting exactly how technological progress will unfold is much like predicting the weather: feasible in the short term, but impossible over a longer time. Great uncertainty and complexity prevent precise forecasts about, for example, the computing devices we’ll be using thirty years from now or the dominant types of artificial intelligence in 2050 and beyond. But even though we can't predict the weather long term, we can accurately forecast the climate. We know how much warmer and sunnier it will be on average in August than in January, for example, and we know that global average temperatures will rise as we keep adding greenhouse gases to the atmosphere. Similarly, we can predict the "climate" of future technological progress by starting from the knowledge that it will be heavily applied in the areas where it can affect capitalism the most. As we've seen over and over, tech progress supplies opportunities to trim costs (and improve performance) via dematerialization, and capitalism provides the motive to do so. As a result, the Second Enlightenment will continue as we move deeper into the twenty-first century. I'm confident that it will accelerate as digital technologies continue to improve and multiply and global competition continues to increase. We’ll see some of the most striking examples of slim, swap, evaporate, and optimize in exactly the places where the opportunities are biggest. Here are a few broad predictions, spanning humanity's biggest industries. Manufacturing. Complex parts will be made not by the techniques developed during the Industrial Era, but instead by three- dimensional printing. This is already the case for some rocket engines and other extremely expensive items. As 3-D printing improves and becomes cheaper, it will spread to automobile engine blocks, manifolds and other complicated arrangements of pipes, airplane struts and wings, and countless other parts. Because 3-D printing generates virtually no waste and doesn't require massive molds, it accelerates dematerialization. We'll also be building things out of very different materials from what we're using today. We're rapidly improving our ability to use machine learning and massive amounts of computing power to screen the huge number of molecules available in the world. Well use this ability to determine which substances would be best for making flexible solar panels, more efficient batteries, and other important equipment. Our search for the right materials to use has so far been slow and laborious. That's about to change. So is our ability to understand nature's proteins, and to generate new ones. All living things are made out of the large biomolecules known as proteins, as are wondrous materials such as spiders' silk. The cells in our bodies are assembly lines for proteins, but we currently understand little about how these assembly lines work—how they fold a two-dimensional string of amino acids into a complicated 3-D protein. But thanks to digital tools, we're learning quickly. In 2018, as part of a contest, the AlphaFold software developed by Google DeepMind correctly guessed the structure of twenty-five out of forty-three proteins it was shown; the second-place finisher guessed correctly three times. DeepMind cofounder Demis Hassabis says, "We [haven't] solved the protein-folding problem, this is just a first step... but we have a good system and we have a ton of ideas we haven't implemented yet." As these good ideas accumulate, they might well let us make spider-strength materials. Energy. One of humanity's most urgent tasks in the twenty-first century is to reduce greenhouse gas emissions. Two ways to do this are to become more efficient in using energy and, when generating it, to shift away from carbon-emitting fossil fuels. Digital tools will help greatly with both. Several groups have recently shown that they can combine machine learning and other techniques to increase the energy efficiency of data centers by as much as 30 percent. This large improvement matters for two reasons. First, data centers are heavy users of energy, accounting for about 1 percent of global electricity demand. So efficiencies in these facilities help. Second, and more important, these gains indicate how much the energy use of all our other complicated infrastructures— everything from electricity grids to chemical plants to steel mills—can be trimmed. All are a great deal less energy efficient than they could be. We have both ample opportunity and ample incentive now to improve them. Both wind and solar power are becoming much cheaper, so much so that in many parts of the world they're now the most cost-effective options, even without government subsidies, for new electrical generators. These energy sources use virtually no resources once they're up and running and generate no greenhouse gases; they're among the world champions of dematerialization. In the decades to come they might well be joined by nuclear fusion, the astonishingly powerful process that takes place inside the sun and other stars. Harnessing fusion has been tantalizingly out of reach for more than half a century—the old joke is that it's twenty years away and always will be. A big part of the problem is that it's hard to control the fusion reaction inside any human- made vessel, but massive improvements in sensors and computing power are boosting hope that fusion power might truly be only a generation away.

#### ---Physical limits aren’t absolute---laundry list of warrants.

Bailey 18 [Ronald; February 16; B.A. in Economics from the University of Virginia, member of the Society of Environmental Journalists and the American Society for Bioethics and Humanities, citing a compilation of interdisciplinary research; Reason, “Is Degrowth the Only Way to Save the World?” https://reason.com/2018/02/16/is-degrowth-the-only-way-to-save-the-wor; RP]

Unless us folks in rich countries drastically reduce our material living standards and distribute most of what we have to people living in poor countries, the world will come to an end. Or at least that's the stark conclusion of a study published earlier this month in the journal Nature Sustainability. The researchers who wrote it, led by the Leeds University ecological economist Dan O'Neill, think the way to prevent the apocalypse is "degrowth."

Vice, pestilence, war, and "gigantic inevitable famine" were the planetary boundaries set on human population by the 18th-century economist Robert Thomas Malthus. The new study gussies up old-fashioned Malthusianism by devising a set of seven biophysical indicators of national environmental pressure, which they then link to 11 indicators of social outcomes. The aim of the exercise is to concoct a "safe and just space" for humanity.

Using data from 2011, the researchers calculate that the annual per capita boundaries for the world's 7 billion people consist of the emission of 1.6 tons of carbon dioxide per year and the annual consumption of 0.9 kilograms of phosphorus, 8.9 kilograms of nitrogen, 574 cubic meters of water, 2.6 tons of biomass (crops and wood), plus the ecological services of 1.7 hectares of land and 7.2 tons of material per person.

On the social side, meanwhile, the researchers say that life satisfaction in each country should exceed 6.5 on the 10-point Cantril scale, that healthy life expectancy should average at least 65 years, and that nutrition should be over 2,700 calories per day. At least 95 percent of each country's citizens must have access to good sanitation, earn more than $1.90 per day, and pass through secondary school. Ninety percent of citizens must have friends and family they can depend on. The threshold for democratic quality must exceed 0.8 on an index scale stretching from -1 to +1, while the threshold for equality is set at no higher than 70 on a Gini Index where 0 represents perfect equality and 100 implies perfect inequality. They set the threshold for percent of labor force employed at 94 percent.

So how does the U.S. do with regard to their biophysical boundaries and social outcomes measures? We Americans transgress all seven of the biophysical boundaries. Carbon dioxide emissions stand at 21.2 tons per person; we each use an average of 7 kilograms of phosphorus, 59.1 kilograms of nitrogen, 611 cubic meters of water, and 3.7 tons of biomass; we rely on the ecological services of 6.8 hectares of land and 27.2 tons of material. Although the researchers urge us to move "beyond the pursuit of GDP growth to embrace new measures of progress," it is worth noting that U.S. GDP is $59,609 per capita.

On the other hand, those transgressions have provided a pretty good life for Americans. For example, life satisfaction is 7.1; healthy life expectancy is 69.7 years; and democratic quality stands at 0.8 points. The only two social indicators we just missed on were employment (91 percent) and secondary education (94.7 percent).

On the other hand, our hemisphere is home to one paragon of sustainability—Haiti. Haitians breach none of the researchers' biophysical boundaries. But the Caribbean country performs abysmally on all 11 social indicators. Life satisfaction scores at 4.8; healthy life expectancy is 52.3 years; and Haitians average 2,105 calories per day. The country tallies -0.9 on the democratic quality index. Haiti's GDP is $719 per capita.

Other near-sustainability champions include Malawi, Nepal, Myanmar, and Nicaragua. All of them score dismally on the social indicators, and their GDPs per capita are $322, $799, $1,375, and $2,208, respectively.

The country that currently comes closest to the researchers' ideal of remaining within its biophysical boundaries while sufficient social indicators is…Vietnam. For the record, Vietnam's per capita GDP is $2,306.

"Countries with higher levels of life satisfaction and healthy life expectancy also tend to transgress more biophysical boundaries," the researchers note. A better way to put this relationship is that more wealth and technology tend to make people happier, healthier, and freer.

O'Neill and his unhappy team fail drastically to understand how human ingenuity unleashed in markets is already well on the way toward making their supposed planetary boundaries irrelevant. Take carbon dioxide emissions: Supporters of renewable energy technologies say that their costs are already or will soon be lower than those of fossil fuels. Boosters of advanced nuclear reactors similarly argue that they can supply all of the carbon-free energy the world will need. There's a good chance that fleets of battery-powered self-driving vehicles will largely replace private cars and mass transit later in this century.

Are we about to run out of phosphorous to fertilize our crops? Peak phosphorus is not at hand. The U.S. Geological Survey (USGS) reports that at current rates of mining, the world's known reserves will last 266 years. The estimated total resources of phosphate rock would last over 1,140 years. "There are no imminent shortages of phosphate rock," notes the USGS. With respect to the deleterious effects that using phosphorus to fertilize crops might have outside of farm fields, researchers are working on ways to endow crops with traits that enable them to use less while maintaining yields.

O'Neill and his colleagues are also concerned that farmers are using too much nitrogen fertilizer, which runs off fields into the natural environment and contributes to deoxygenated dead zones in the oceans, among other ill effects. This is a problem, but one that plant breeders are already working to solve. For example, researchers at Arcadia Biosciences have used biotechnology to create nitrogen-efficient varieties of staples like rice and wheat that enable farmers to increase yields while significantly reducing fertilizer use. Meanwhile, other researchers are moving on projects to engineer the nitrogen fixation trait from legumes into cereal crops. In other words, the crops would make their own fertilizer from air.

Water? Most water is devoted to the irrigation of crops; the ongoing development of drought-resistant and saline-tolerant crops will help with that. Hectares per capita? Humanity has probably already reached peak farmland, and nearly 400 million hectares will be restored to nature by 2060—an area almost double the size of the United States east of the Mississippi River. In fact, it is entirely possible that most animal farming will be replaced by resource-sparing lab-grown steaks, chops, and milk. Such developments in food production undermine the researchers' worries about overconsumption of biomass.

And humanity's material footprint is likely to get smaller too as trends toward further dematerialization take hold. The price system is a superb mechanism for encouraging innovators to find ways to wring ever more value out less and less stuff. Rockefeller University researcher Jesse Ausubel has shown that this process of absolute dematerialization has already taken off for many commodities.

After cranking their way through their models of doom, O'Neill and his colleagues lugubriously conclude: "If all people are to lead a good life within planetary boundaries, then the level of resource use associated with meeting basic needs must be dramatically reduced." They are right, but they are entirely backward with regard to how to achieve those goals. Economic growth provides the wealth and technologies needed to lift people from poverty while simultaneously lightening humanity's footprint on the natural world. Rather than degrowth, the planet—and especially its poor people—need more and faster economic growth.

#### 2---COVID ensures transition from decentralized markets to central organization---shields links, ensures sustainability---alt ensures global civil war

Dalio 20 (Ray Dalio is a M.B.A. from Harvard Business School, founded Bridgewater Associates. “Ray Dalio: We must reform capitalism, not abandon it.” 5-15-20. https://www.cnn.com/2020/05/15/perspectives/ray-dalio-capitalism/index.html)

The economic world order is changing whether we like it or not. You can see it happening as people and companies around the world are losing income and savings, and central banks and governments are providing them money to try to compensate for those losses. And you can see it as the free market is no longer determining the allocation of capital — governments are.

Central governments and central banks are now creating trillions in money and credit and directing it to those they want to receive it. This will soon be followed by a debate, perhaps even a fight, about where this money should come from and who should have what in the new world. Such controls of spending and the ensuing political conflicts over it have occurred many times in history, especially when severe economic and financial downturns were accompanied by high levels of indebtedness and large wealth gaps. History has taught us that these conflicts take place both within and between countries. How these conflicts are resolved will determine whether the economic pie will grow and be divided well or contract and be divided through fighting.

Chances are that the new system we end up with will be significantly different from the capitalist system that we've gotten used to.

These sorts of changes to the world order have taken place many times in history, most recently between 1930 and 1945, in periods characterized by intensifying divisions over the best approach for divvying up wealth and power — and over which economic and political system is most effective at doing so. For example, in the transition from the Roaring 1920s to the depressing 1930-1945 period, we saw relatively capitalist and democratic systems shift to systems that were more redistributive of wealth and more autocratic. Such systems included communism (extreme redistribution of wealth with autocratic political controls such as in Russia), fascism (autocratic control of both the economy and politics such as in Germany, Japan, Italy and Spain) and democratic socialism (more moderate wealth redistributions and more moderate moves toward top-down control that existed within democracies such as those in the United States and the United Kingdom). Under the pressure of such stress tests, some societies bend (e.g., the capitalist and democratic systems in the United Kingdom during the 1930s) and others break (e.g., Germany, Japan, Italy and Spain all abandoned their systems in favor of autocracy). Most countries in the world are now under that kind of stress.

As the current crisis unfolds, we should remember that throughout history, capitalism has proven to be the best system, though it can sometimes be highly flawed. It is typically best when it comes to allocating resources and raising a society's productivity and living standards because of how profit-making works. Very simply, if the value of a product is greater than the value of the resources used to produce it, it will be profitable and that endeavor will gain more resources. If the value of a product is less than the cost of the resources used to produce it, it will lose money and that endeavor will shut down. The system also financially rewards individuals who come up with products that people want and, if they can do that, it provides them with capital from investors who risk their own money based on their assessments of the economic merits of these ideas.

While this profit-making capitalism has worked well in this way, it has also been intolerably imperfect in providing equal opportunity. It has failed to deliver people equal opportunities to be productive if they can be and to take care of the basic needs of people who can't be. It also doesn't create limits on how bad people's living conditions can be or on how decadent spending can be. To me, most tragically, it allows vast numbers of children to grow up in environments of violent squalor, which is both economically and socially bad. It is economically bad because the costs of having large numbers of unproductive people are enormous compared to the benefits of having productive people. And it is socially bad because a system that doesn't provide equal opportunity can't be considered fair — and unfair systems eventually lead to disruptive social conflicts.

To be clear, I'm not saying that there should be laws restricting how people spend their money, because I don't believe there should be. But I am saying that such huge gaps in spending and living conditions are threatening the existence of our system. It is for these reasons that I believe we need to reform capitalism, not abandon it.

To make society work better, the new system must both increase the size of the pie and divide it well. Our ability to consume is dependent on our ability to produce, not the amount of money we get in the mail. You can't eat money. Somebody must get paid to produce and deliver what we consume. And we can't raise our living standards by just giving people money — they need to be incentivized to produce, and that must be done cost-effectively through some system that is not administered from the top. Most fundamentally, that system must strive to provide 1) equal opportunity to all those who have the potential to produce (because that is both most fair and most productive) and 2) basic needs to those who are unable to (because that is humane and what is fundamentally needed to have a good community).

Can't we all — capitalists, socialists, Republicans and Democrats — agree on that? Can't we all agree that whatever system we have, it must do a great job of both increasing the size of the pie and dividing it well?

If we can agree that these things are essential because the alternatives are terrible, then people of different ideologies will be more civil with each other and more willing to work through their disagreements thoughtfully so that we can achieve agreement for the good of the whole. We must figure out how to do that in a collaborative and skilled way. If we can't do that, we will have a civil war of some form that will tragically tear us apart and shrink the pie for everyone.

#### Cap solves---

#### 1---War.

Mousseau 19—Professor in the School of Politics, Security, and International Affairs at the University of Central Florida (Michael, “The End of War: How a Robust Marketplace and Liberal Hegemony Are Leading to Perpetual World Peace,” International Security, Volume 44, Issue 1, Summer 2019, p.160-196, dml)

Is war becoming obsolete? There is wide agreement among scholars that war has been in sharp decline since the defeat of the Axis powers in 1945, even as there is little agreement as to its cause.1 Realists reject the idea that this trend will continue, citing states' concerns with the “security dilemma”: that is, in anarchy states must assume that any state that can attack will; therefore, power equals threat, and changes in relative power result in conflict and war.2 Discussing the rise of China, Graham Allison calls this condition “Thucydides's Trap,” a reference to the ancient Greek's claim that Sparta's fear of Athens' growing power led to the Peloponnesian War.3

This article argues that there is no Thucydides Trap in international politics. Rather, the world is moving rapidly toward permanent peace, possibly in our lifetime. Drawing on economic norms theory,4 I show that what sometimes appears to be a Thucydides Trap may instead be a function of factors strictly internal to states and that these factors vary among them. In brief, leaders of states with advanced market-oriented economies have foremost interests in the principle of self-determination for all states, large and small, as the foundation for a robust global marketplace. War among these states, even making preparations for war, is not possible, because they are in a natural alliance to preserve and protect the global order. In contrast, leaders of states with weak internal markets have little interest in the global marketplace; they pursue wealth not through commerce, but through wars of expansion and demands for tribute. For these states, power equals threat, and therefore they tend to balance against the power of all states. Fearing stronger states, however, minor powers with weak internal markets tend to constrain their expansionist inclinations and, for security reasons, bandwagon with the relatively benign market-oriented powers.

I argue that this liberal global hierarchy is unwittingly but systematically buttressing states' embrace of market norms and values that, if left uninterrupted, is likely to culminate in permanent world peace, perhaps even something close to harmony. My argument challenges the realist assertion that great powers are engaged in a timeless competition over global leadership, because hegemony cannot exist among great powers with weak markets; these inherently expansionist states live in constant fear and therefore normally balance against the strongest state and its allies.5 Hegemony can exist only among market-oriented powers, because only they care about global order. Yet, there can be no competition for leadership among market powers, because they always agree with the goal of their strongest member (currently the United States) to preserve and protect the global order based on the principle of self-determination. If another commercial power, such as a rising China, were to overtake the United States, the world would take little notice, because the new leading power would largely agree with the global rules promoted and enforced by its predecessor. Vladimir Putin's Russia, on the other hand, seeks to create chaos around the world. Most other powers, having market-oriented economies, continue to abide by the hegemony of the United States despite its relative economic decline since the end of World War II.6

To support my theory that domestic factors determine states' alignment decisions, I analyze the voting preferences of members of the United Nations General Assembly from 1946 to 2010. I find that states with weak internal markets tend to disagree with the foreign policy preferences of the largest market power (i.e., the United States), but more so if they are major powers or have stronger rather than weaker military and economic capabilities. The power of states with robust internal markets, in contrast, appears to have no effect on their foreign policy preferences, as market-oriented states align with the market leader regardless of their power status or capabilities. I corroborate that this pattern may be a consequence of states' interest in the global market order by finding that states with higher levels of exports per capita are more likely than other states to have preferences aligned with those of the United States; those with lower levels of exports are more likely to have interests that do not align with the United States, but again more so if they are stronger rather than weaker.

Liberal scholars of international politics have long offered explanations for why the incidence of war may decline, generally beginning with the assumption that although the security dilemma exists, it can be overcome with the help of factors external to states.7 Neoliberal institutionalists treat states as like units and international organization as an external condition.8 Trade interdependence is dyadic and thus an external condition.9 Democracy is an internal factor, but theories of democratic peace have an external dimension: peace is the result of the expectations of states' behavior informed by the images that leaders create of each other's regime types.10 In contrast, I show that the security dilemma may not exist at all and how peace can emerge in anarchy with states pursuing their interests determined entirely by internal factors.11