## 1NC

### Space Col CP

#### CP: The appropriation of outer space by private entities through bounded first possession by landfall is just.

#### CP is the best system to develop Mars – common ownership chills first movers and is less efficient.

Collins 08 (Lecturer, The City Law School, City University, London, UK. B.A.Hon., J.D.(Toronto), M.Sc., B.C.L. (Oxford)), "EFFICIENT ALLOCATION OF REAL PROPERTY RIGHTS ON THE PLANET MARS" B.U. J. SCI. & TECH. L. [Vol.14:201, NCS, DOA 2/5/22, https://www.bu.edu/jostl/files/2015/02/Collins\_142.pdf

As an alternative to fixing future claims on Mars based upon a re-allocation of pre-existing ones, the most efficient mechanism of real property allocation of an un-owned res nullius planet Mars would be a limited form of first possession: the allotment of only a portion of land to the first arriving organization, not the entire surface of the planet. The size of the allocation would be set at the optimal level to encourage exploration and development while conserving land for future explorers. The first landers could claim all terrain, for example, within a hundred kilometer radius of their landing point subject to an increase if productive use is made of an even larger portion. The rest of the planet would remain un-owned and available to become possessed by subsequent explorers. This bounded first possession is in keeping with the language of the Outer Space Treaty and Moon Treaties that prohibit only sovereign claims to the celestial body, which could be interpreted to mean the planetary sphere itself. Such a credible interpretation reads in the word “entire” to the following provision for the purpose of clarity: “neither the entire surface or entire subsurface of the Moon [or Mars] shall become the property of any State”.”74 Partial allocation as described is just because landing on one minuscule portion of a world should not entitle a claimant to ownership of all of it, much of which may be left completely idle by the original explorer, resulting in an inefficient use of the planet’s resources. The problem of inefficient races to achieve the legal right to first possession will be avoided by this regime, as second and third place finishers will be rewarded with other plots of land on the surface. Consequently pre-mature and therefore non-productive missions will be avoided because there is no risk of exclusion for failing to land first; the marginal benefit of arriving second will be as high as the marginal benefit of arriving first. Of course, the pride engendered by first arrival, such as that generated by the first Moon landing, would help to encourage earlier Mars expeditions rather than later ones. Incentive to settle on Mars before others may similarly result from the fact that some regions of the planet could be more valuable than others. For example, just as the flat, northern hemisphere would may be more conducive for agriculture than the rugged southern hemisphere, the equatorial zone would probably hold greater value because of their warmer climates.75 Part of the concern of developing nations in espousing the Common Heritage principle for planetary bodies was that the planet’s resources would already be depleted by the time nations with weaker initial resource endowments (the developing world) are capable of exploiting the land on Mars.76 Plot ownership would address this concern since vast regions of Mars would likely remain un-owned for centuries, giving developing nations a chance to “catch up”. Private easements and restrictive covenants arrived at by bargaining among the landed owners (rather than through international political consensus) and enforced through private litigation would control competing land uses such as over exploitation or pollution in order to produce an efficient allocation of resources. At least in the early stages of colonization there would be no need to incur the cost of a special “Mars Court” to adjudicate such disputes. Instead, landowners could litigate in the courts of their choice on Earth, subject to that court’s own rules on taking jurisdiction. For example, an American corporation owning land on Mars could bring suit in nuisance against another American landowner in the Federal court of the United States.77 Disputes between sovereign landowners on Mars could similarly be brought in the International Court of Justice.78 Again, it is expected that such private land use adjudication among fewer parties should be less costly than public control of commonly held land through regulation.79 Moreover, bargaining among a limited number of initial owners should arrive at the most efficient manner of land use without the need to resort to lawsuits. Excessive land use regulation resulting from the need to satisfy all decision-makers could diminish the overall productivity of the land, especially if such regulations were imposed ex post after valuable resources had already been wasted. It is further expected that landowners on Mars would adopt the self-imposed obligation to engage in reasonable and productive use of that land in order to maximize the value of their own holdings. Such “injunctions against waste”80 would become more significant in later stages of settlement when vacant land on Mars had become scarcer. Accordingly, if a plot is not being used efficiently, for example, by an owner that held expertise in space travel but not in colonization, then title in the land could be transferred on the authority of a court, perhaps through the Common Law doctrine of adverse possession,81 to another party that had these skills and intentions. Should a terraforming project be undertaken – transforming the whole of Mars into an environment that could sustain life - landowners would have an incentive to “free ride” by not contributing resources to such an inherently communal project, allowing them to benefit from the labors of others without cost. Perhaps a mandatory fee could be imposed upon all residents by a court in order to address this problem – although it is unclear what legal precedent could be invoked to do so - in advance of the establishment of zoning or centralized governance on the planet.82 Market forces should provide, however, that a party not adding value to its land through development would have an incentive to sell or lease it to a party that would make a more productive use of it. Thus, the first explorers might wish simply to sell their claims as suggested above. To facilitate such bargaining among landowners, the establishment of a land registry system, which would set standardized plot dimensions and record transactions and would represent one of the few costs associated with private ownership of land on Mars, would be necessary.83 The recognition of bounded land claims on a planet appears already to be envisioned by the text of the Moon Treaty which as noted above, permits individual states to retain jurisdiction and control over their personal property, such as bases and equipment, that is brought to the moon.84 However, as noted above, the rights in such chattels are not equivalent to the full property rights exercised by terrestrial landowners since there is no exclusivity – treaty requires parties to allow others to use these equipment and facilities when requested.85 On one hand such compulsory property sharing is economically efficient because it would encourage further development by minimizing one of the costliest aspects of settlement. A subsequent arrival could benefit from existing infrastructure devoting resources to the more productive development of the region without redundant expenditure that would impede overall progress. However, the common property regime envisioned by the space treaties ignores the reality that without adequate compensation for such sharing there might be an incentive to free-ride by waiting for another explorer to incur the initial costs of establishing a Mars base with oxygen/fuel production facilities. It would therefore be more cost effective to be the second or third Mars colonizer, potentially inducing a strategic waiting game. To resolve this problem it should be permissible to charge a fee for the use of one’s facilities because such fees represent the fundamental economic gain of granting property rights in land on Mars. Developed land, such as land with a base upon it that could sustain human life, becomes valuable to subsequent visitors, and this can generate revenue that will offset the initial costs. Bargaining would naturally set the use fee at an optimal level that encouraged subsequent parties to land and make use of existing facilities and would not be too low to deter the initial landing and construction. Thus, the direction to share resources in the Moon Treaty might be unnecessary – sharing might increase wealth for all parties, much as land values increase in proportion to the rise in population of an area. Given that large scale inhabitation of Mars might only result from a catastrophe on Earth, there may be some need to incorporate the common law defense of necessity for emergency trespass, although this defense would not preclude the payment of reasonable compensation for use or damage to existing infrastructure.86

#### Colonization of Mars is feasible but requires investment incentive now.

Martin & Saydam 21

(BA Journalism University of Central Lancashire, Media & Content Coordinator for The University of New South Wales Serkan Saydam received his BSc, MSc and PhD degrees in Mining Engineering from the Dokuz Eylul University, Izmir, Turkey and completed his Postdoctoral Fellowship at the University of Witwatersrand, Johannesburg, South Africa. He then worked at De Beers for 3 years as project manager in Johannesburg, South Africa. Serkan joined the School of Mining Engineering as a Senior Lecturer in 2006 and was promoted to Associate Professor in 2012. Serkan then was then promoted to the Professorial role in 2017 and he is currently working as a Professor and Director of Research at the School of Minerals and Energy Resources Engineering at UNSW. A key focus of his research is to address the current needs and future challenges faced by the mining industry. These are generally very complex engineering problems, as mining environments become more extreme and constraints are imposed due to increasing social, environmental, and health and safety standards. His fields of research include ground control, mine planning & design, technology integration, new mining methods and off-Earth mining. In addition, he established research collaboration with NASA's Jet Propulsion Laboratory & Kennedy Space Center, and Luxembourg Space Agency as well more than 20 research organisations and universities globally. He has more than 250 publications and graduated 18 PhD students. Serkan is currently Fellow Member of Australian Institution of Mining and Metallurgy; President of the ISRM Commission on Planetary Rock Mechanics; Deputy Director of the Australian Centre for Space Engineering Research (ACSER) at UNSW; Deputy Secretary General and Council Member of the SOMP (The Society of Mining Professors). <https://newsroom.unsw.edu.au/news/science-tech/mars-settlement-likely-2050-says-unsw-expert-%E2%80%93-not-levels-predicted-elon-musk>, USNW Sydney Newsroom, 3/10/21, NCS, <https://newsroom.unsw.edu.au/news/science-tech/mars-settlement-likely-2050-says-unsw-expert-%E2%80%93-not-levels-predicted-elon-musk> brackets for spelling mistake

Robotic mining that can provide water and fuel is the key to developing a colony on the red planet within the next 30 years. Mars will be colonised by humans by the year 2050, as long as autonomous mining processes quickly become more commercially viable. That’s the view of Professor Serkan Saydam from UNSW Sydney in the wake of the amazing landing on Mars by NASA’s Perseverance rover. Perseverance is expected to provide answers about whether forms of life ever existed on the red planet, but it is also designed to help address the challenges of future human expeditions there. Professor Saydam, from the School of Mineral Energy Resources Engineering, says the main focus in terms of creating a colony on Mars is finding water – and being able to extract it and process it using robots before humans land. “Everything is all about water,“ Prof. Saydam says. “You use water as a life support, plus also being able to separate out the hydrogen to use as an energy source. “The process for having humans on Mars will be to set up operations, go there and produce water with robots first, and then be able to extract the hydrogen to make the energy ready before people arrive. “Innovation in robotics and autonomous systems are clearly important so that we have the water ready and the hydrogen separated and ready for when human beings land. “At the moment, we don’t have ability to do it. There are significant research efforts, specifically here at UNSW under ACSER (Australian Centre for Space Engineering Research), about the best way to do it, but there is no consensus yet. It also depends on how many people we expect to be living on Mars. Is it five, or 5000, or 50,000, or even more?“ Entrepreneur Elon Musk has claimed he’s confident there will be a city of 1 million on Mars by 2050, transported there by 1000 Starships proposed by his SpaceX venture, with plans for up to three rocket launches per day. Prof. Saydam says that may be unrealistic in the specific timeframe, but admits that demand for travel and a potential colonisation of Mars is what’s needed to drive the technological developments required. “I think the technology is ready and we already have the knowledge, but the main problem is having the focus,“ says Prof. Saydam, who is organising an International Future Mining Conference in December 2021 that will feature former NASA astronaut Pamela Melroy and Honeybee Robotics vice-president Kris Zacny. “It’s a bigger question: ‘Why don’t we do that already on earth? Why are we still using human beings for physical work in mining here?’ We have huge experience in mining, but still heavily depend on humans. “One issue is that demand is not there. For companies to get involved in developing products (for Mars missions), they need to be able to produce minerals or something that can be used for manufacturing goods and then sell it. “At the moment, everything is just a cost and there is no revenue for companies.“ However, that could be starting to change. United Launch Alliance, a joint venture between Lockheed Martin and Boeing who are heavily invested in the rockets used to launch spaceships, has publicly announced they will pay $500 per kilogram for fuel – derived from water – supplied on the moon. That rises to $3000 per kilogram if the fuel is available in a low-earth orbit. “That immediately creates a market,“ Prof. Saydam says. “Plus, if Elon Musk does what he says and puts people on the surface of Mars in 20 years, then that also creates a market. “I believe a colony on Mars is going to happen, but between 2040 and 2050 is more feasible. This could be shortened depending on the technological advances that can reduce the costs or [form] from stronger motivation. “What I think will happen is that first of all we will do these activities on the moon and have a colony there. Then we can use the moon as a petrol station to get to Mars and beyond. “But before 2050, I think we will have settlements on both the moon and Mars.“

#### And, private appropriation is key – fear of expropriation.

Collins 08 (Lecturer, The City Law School, City University, London, UK. B.A.Hon., J.D.(Toronto), M.Sc., B.C.L. (Oxford)), "EFFICIENT ALLOCATION OF REAL PROPERTY RIGHTS ON THE PLANET MARS" B.U. J. SCI. & TECH. L. [Vol.14:201, NCS, DOA 2/5/22, https://www.bu.edu/jostl/files/2015/02/Collins\_142.pdf

III. THE CURRENT LEGAL REGIME FOR PROPERTY IN OUTER SPACE In order to frame the discussion of future real property claims on Mars, this article will briefly discuss existing law on property in space. There are currently two relevant international treaties: The Outer Space Treaty and the Moon Treaty, both of which establish that Mars (and the other planets) are res communis: common property owned by the people of Earth. The former agreement, signed in 1967 as the result of efforts of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), establishes that space is “the province of all mankind” and “free for exploration and use by all states without discrimination of any kind, on a basis of equality” and also that there should be “free access to all areas of celestial bodies”, 16 clearly precluding the exclusivity of possession that is the foundation of ownership. Celestial bodies, including Mars, cannot be the subject of national appropriation by claims of sovereignty.17 The Outer Space treaty was signed by the United States, the USSR and 89 other nations and as such it can be viewed as a legally binding commitment in international law. The later Moon Treaty, ratified by only seven countries, establishes that all resources outside the earth are the “common heritage of mankind” and that no entity, either public or private can exclusively own any space resource,18 and that there must be “equitable sharing” by all state parties in the benefits derived from space resources, taking into consideration the needs of developing countries.19 This language of public ownership mirrors The Law of the Sea convention, which establishes that no nation can own the world’s oceans.20 The Moon Treaty permits the retention of “samples” taken from planetary bodies, although it encourages that such materials be made available to other nations for the purposes of scientific experiment.21 The laws of space, interpreted by some to allow for commercial mining, thus recognize the concept of personal property.22 Although the Moon Treaty allows parties to retain ownership of the equipment, vehicles and installations that they place there23 this is not true ownership in the common law sense since there is no right to exclude because Article XV requires that all vehicles, installations and equipment shall be open to use by all other parties. This partial acknowledgement of private personalty may hold the potential for “quasi-sovereignty” involving ownership of objects on the surface of planets by individuals or corporations.24 The simple delineation between equipment and land may be difficult to draw on Mars, however, because the planet’s atmosphere necessitates artificial construction, such as a greenhouse, in order to render the surface agriculturally productive or habitable. According to the common law, a chattel (in which ownership is retained in space) loses its status as a chattel and becomes a fixture when it is so affixed to land that it becomes part of the land,25 and evidently according to treaty at that point ownership is lost. In this way a base built upon the soil or rock of Mars for the purpose of habitation or as a greenhouse, even if it is resting upon the planet’s surface under its own weight without attachment, as long as it is intended to permanently improve the land, will become a fixture26 and is therefore common property. Thus, there is a strong risk that an investment such as a base that possibly costs billions of dollars in preparation and transportation would become public property once it was placed upon the planet’s surface. Together the space treaties embody the now widely-criticized notion27 that every human, as represented by the states in which they are members, has an effective “right” to Mars. Under this regime the allocation of Martian resources, possibly including land itself, will be determined by the “administrative model” in which each nation decides the distribution based on each country having an equal vote, much like the current United Nations regime.28 Not surprisingly, the United States and the Soviet Union rejected the limitations on the use of space resources, refusing to sign the Moon Treaty. Indeed none of the signatories of the Moon Treaty has space travel capability, suggesting that it does not reflect any practical concerns in space exploration and development. Rather, the Moon Treaty illustrates resistance to the idea of private advancement through the acquisition or use of space resources as expressed through the voting dominance of less-developed nations in intergovernmental organizations.29 Still, as many legal commentators have noted, the benefit sharing doctrines enunciated in the treaties are fortuitously vague and as such have little force in international law. At best they are loose policy guidelines, not concrete obligations.30 Interestingly, the treaties also present inconsistent principles: the Moon Treaty’s common ownership concept contradicts the prohibition against national appropriation found in the Outer Space Treaty,31 although this is little more than a semantic distinction. The ambiguity of these treaties and the fact that the Moon Treaty has not been ratified by space-faring nations suggests that property law in space remains, hopefully for the purpose of incentivization, clouded. Many commentators, notably Carl W. Christol, further assert the need to clarify and formalize the law of space exploration generally.32 An internationally recognized legal regime for property rights on Mars is essential; otherwise uncertainty (if not the fear of expropriation in the name of mankind) will endanger financial investment both in reaching and then colonizing the planet.

#### Life on earth is doomed – countless eventualities and unforeseen dangers.

Meyer 16

(Robinson Meyer is a staff writer at The Atlantic. He is the author of the newsletter The Weekly Planet, and a co-founder of the COVID Tracking Project at The Atlantic.), "Human Extinction Isn't That Unlikely", The Atlantic, 4/29/16, NCS, https://www.theatlantic.com/technology/archive/2016/04/a-human-extinction-isnt-that-unlikely/480444/

Nuclear war. Climate change. Pandemics that kill tens of millions. These are the most viable threats to globally organized civilization. They’re the stuff of nightmares and blockbusters—but unlike sea monsters or zombie viruses, they’re real, part of the calculus that political leaders consider everyday. A new report from the U.K.-based Global Challenges Foundation urges us to take them seriously. The nonprofit began its annual report on “global catastrophic risk” with a startling provocation: If figures often used to compute human extinction risk are correct, the average American is more than five times likelier to die during a human-extinction event than in a car crash. Partly that’s because the average person will probably not die in an automobile accident. Every year, one in 9,395 people die in a crash; that translates to about a 0.01 percent chance per year. But that chance compounds over the course of a lifetime. At life-long scales, one in 120 Americans die in an accident. Yet the risk of human extinction due to climate change—or an accidental nuclear war, or a meteor—could be much higher than that. The Stern Review, the U.K. government’s premier report on the economics of climate change, assumed a 0.1-percent risk of human extinction every year. That may sound low, but it adds up when extrapolated to century-scale. Across 100 years, that figure would entail a 9.5 percent chance of human extinction. And that number might even underestimate the risk. Another Oxford survey of experts from 2008 posited the annual extinction risk to be a higher figure, 0.2 percent. And the chance of dying from any major global calamity is also likely higher. The Stern Review, which supplies the 9.5-percent number, only assumed the danger of species-wide extinction. The Global Challenges Foundation’s report is concerned with all events that would wipe out more than 10 percent of Earth’s human population. “We don’t expect any of the events that we describe to happen in any 10-year period. They might—but, on balance, they probably won’t,” Sebastian Farquhar, the director of the Global Priorities Project, told me. “But there’s lots of events that we think are unlikely that we still prepare for.” For instance, most people demand working airbags in their cars and they strap in their seat-belts whenever they go for a drive, he said. We may know that the risk of an accident on any individual car ride is low, but we still believe that it makes sense to reduce possible harm. So what kind of human-level extinction events are these? The report holds catastrophic climate change and nuclear war far above the rest, and for good reason. On the latter front, it cites multiple occasions when the world stood on the brink of atomic annihilation. While most of these occurred during the Cold War, another took place during the 1990s, the most peaceful decade in recent memory: In 1995, Russian systems mistook a Norwegian weather rocket for a potential nuclear attack. Russian President Boris Yeltsin retrieved launch codes and had the nuclear suitcase open in front of him. Thankfully, Russian leaders decided the incident was a false alarm. Climate change also poses its own risks. As I’ve written about before, serious veterans of climate science now suggest that global warming will spawn continent-sized superstorms by the end of the century. Farquhar said that even more conservative estimates can be alarming: UN-approved climate models estimate that the risk of six to ten degrees Celsius of warming exceeds 3 percent, even if the world tamps down carbon emissions at a fast pace. “On a more plausible emissions scenario, we’re looking at a 10-percent risk,” Farquhar said. Few climate adaption scenarios account for swings in global temperature this enormous. Other risks won’t stem from technological hubris. Any year, there’s always some chance of a super-volcano erupting or an asteroid careening into the planet. Both would of course devastate the areas around ground zero—but they would also kick up dust into the atmosphere, blocking sunlight and sending global temperatures plunging. (Most climate scientists agree that the same phenomenon would follow any major nuclear exchange.) Yet natural pandemics may pose the most serious risks of all. In fact, in the past two millennia, the only two events that experts can certify as global catastrophes of this scale were plagues. The Black Death of the 1340s felled more than 10 percent of the world population. Eight centuries prior, another epidemic of the Yersinia pestis bacterium—the “Great Plague of Justinian” in 541 and 542—killed between 25 and 33 million people, or between 13 and 17 percent of the global population at that time. No event approached these totals in the 20th century. The twin wars did not come close: About 1 percent of the global population perished in the Great War, about 3 percent in World War II. Only the Spanish flu epidemic of the late 1910s, which killed between 2.5 and 5 percent of the world’s people, approached the medieval plagues. Farquhar said there’s some evidence that the First World War and Spanish influenza were the same catastrophic global event—but even then, the death toll only came to about 6 percent of humanity. The report briefly explores other possible risks: a genetically engineered pandemic, geo-engineering gone awry, an all-seeing artificial intelligence. Unlike nuclear war or global warming, though, the report clarifies that these remain mostly notional threats, even as it cautions: [N]early all of the most threatening global catastrophic risks were unforeseeable a few decades before they became apparent. Forty years before the discovery of the nuclear bomb, few could have predicted that nuclear weapons would come to be one of the leading global catastrophic risks. Immediately after the Second World War, few could have known that catastrophic climate change, biotechnology, and artificial intelligence would come to pose such a significant threat.

#### Space col brings infinite expected value – outweighs.

Baum 16

[Seth D. Baum, Executive Director of the Global Catastrophic Risk Institute, “The Ethics of Outer Space: A Consequentialist Perspective,” 2016, Springer, pp. 115-116, EA]

Space colonization is notable because it may be able to bring utterly immense increases in intrinsic value. Early colonies might start small, given that other planets and moons have inhospitable environments. However, it may be possible to build large indoor colonies or create more hospitable outdoor environments (i.e., terraforming). Even just on other planets and moons in the Solar System, space colonies could multiply the total area available for human habitation. And there are many more planets around other stars, as ongoing research on exoplanets is now learning. One recent study estimates 22 % of Sun-like stars have Earth-like exoplanets (Petigura et al. 2013), implying billions to tens of billions of potentially habitable planets across the galaxy. Opportunities at any given star may also be quite a bit greater than those available only on planets. Earth only receives about one two-billionth of the Sun’s radiation. To collect all the Sun’s radiation, humanity would need a Dyson swarm (named after Dyson 1960), which is a series of structures that surrounds a star, collecting its radiation to power a civilization. A Dyson swarm around the Sun could potentially enable a civilization a billion times larger than is possible on Earth. Likewise, Dyson swarms around one billion stars would bring humanity approximately 1018 (one billion–billion) times more energy per unit time. Space colonies could also increase the amount of time available for human civilization. Earth will remain habitable for a few billion more years (O’Malley-James et al. 2014). Stars will continue shining for about 1014 more years (Adams 2008). That gives us an additional 105 times more energy, for a total of 1023 times more energy than is available on Earth. After the stars fade, other energy sources may be available. And even if our current universe eventually becomes uninhabitable, it may be possible to move to other universes (Kaku 2005). The physics here is speculative, but it cannot be ruled out, and hence there is a nonzero chance of a literally infinite opportunity for space colonization (Baum 2010a). Whether the opportunity is infinite or merely, say, 1023 times larger than what can be done on Earth, the opportunity is clearly immense. As long as space colonization is an improvement (Sect. 8.3.1), then it would seem that the consequentialist should prioritize space colonization. The sooner space colonization begins, the more of its immense opportunity can be gained. Indeed, Ćirković (2002) estimates 5 × 1046 human lifetimes are lost for every century in which space colonization is delayed.

## Case

### Debris

#### They solve 0% of this advantage- satellites don’t count as appropriation because no territory is being permanently claimed as a company’s property, just being temporarily occupied

#### Be extremely skeptical of their internal links: a] no internal link to nuclear war- the OST bans use and deployment of nukes in space b] all of their scenarios for escalation are extremely nebulous- which actors escalate? c] even without NewSpace, countries already have satellites and ASATs in space that inevitably trigger their impacts d] they have no evidence that says appropriation is key

#### Link turn: Only profit motive solves debris.

Nelson 18 [Peter Lothian Nelson and Walter E. Block, \*\* Harold E. Wirth Endowed Chair and Professor of Economics, College of Business, Loyola University New Orleans, “Space Capitalism: How Humans will Colonize Planets, Moons, and Asteroids,” 2018, Springer, pp. 108, EA]

Space debris is a major challenge to space exploration (Goldsmith 2015). The higher the speed (see Chap. 1 on the need for hyper speeds), the worse will be the issue of impact avoidance or damage in the event of impact. It is through the unregulated free market that solutions to intractable problems are found. Explorers will be well motivated to develop methods for detection of both minuscule and massive invisible objects and quick reaction mechanisms for avoidance of things large and small.

#### Kessler syndrome is a process not an event---timeframe is decades and intervening actors check.

Burns Interviewing Kessler **’**13 Corrinne Burns, interviewing Donald Kessler, who made up the concept. [Space junk apocalypse: just like Gravity? 11-15-2013, https://www.theguardian.com/science/blog/2013/nov/15/space-junk-apocalypse-gravity]//BPS

Now? Are we in trouble? Not yet. Kessler syndrome isn't an acute phenomenon, as depicted in the movie – it's a slow, decades-long process. "It'll happen throughout the next 100 years – we have time to deal with it," Kessler says. "The time between collisions will become shorter – it's around 10 years at the moment. In 20 years' time, the time between collisions could be reduced to five years." Fortunately, communications satellites are, in the main, situated high up in geosynchronous orbit (GEO), whereas the risk of collisions lies mainly in the much lower, and more crowded, low Earth orbit (LEO). But that doesn't mean we can relax. "We've got to get a handle on it – we need to prevent the cascade process from speeding up." And the only way to do that is, he says, to begin actively removing junk from space. Charlotte Bewick agrees. She's a mission concepts engineer with the German space technology company OHB System, with special expertise in space junk – specifically, how we can capture it and bring it back to Earth. While agreeing with Kessler that the movie scenario is exaggerated, she remains concerned. "Fragments of junk can naturally re-enter the atmosphere [and so be removed from orbit]. But we're at the stage where the rate of creation of new debris fragments is higher than the rate of natural removal. The orbits most at risk harbour important space assets – satellites for weather forecasting, oil spill and bush fire detection, and polar ice monitoring." Bewick highlights the case of Envisat, a defunct 8,000kg spacecraft circling Earth in an orbit that is very popular with space agencies and, hence, pretty crowded. "If Envisat collides with a piece of debris or a micrometeorite, the fragments could render the whole orbital region unusable." So can we get the junk down, I asked Massimiliano Vasile, part of the Mechanical & Aerospace Department at the University of Strathclyde and co-ordinator of the Stardust network. He told me defunct satellites in the high GEO region have, for some time, been shifted to higher "graveyard orbits" to keep them out of the way. But that's not an option for items in low Earth orbit. For this, he tells me, researchers are looking seriously into active debris removal – in-orbit capture techniques like harpooning, netting and tethering, the use of contactless systems like ion-beams or lasers, and even onboard robotics to position the junk away from high-risk orbital regions. As for middle Earth orbit – well, ideas are welcome, he says. We're in no immediate danger from Kessler syndrome – but it's not a problem that's going away. Despite Gravity's artistic license, Donald Kessler is pleased to see the phenomenon represented on the big screen. "It is very improbable that events would play out as they did in the film," he says. "But if it raises awareness, then that's great."

### Colonialism

#### The counterplan solves the second condition—their evidence assumes the status quo, not the counterplan which reins in corporations by creating clear and limited rules for who can claim space and how.

#### No link—Appropriation doesn’t unfairly disadvantage developing countries

Reinstein 99

Ezra J. Reinstein (JD, Associate at Kirkland & Ellis), Owning Outer Space, 20 Nw. J. Int'l L. & Bus. 59 (1999). JDN. https://scholarlycommons.law.northwestern.edu/njilb/vol20/iss1/7

Except, perhaps, that it may severely disadvantage the lower-tech nations in future. Developing nations fear that by the time they gain the wealth and technology necessary to become players in the space game, the most readily available resources will have already been claimed as private property and be under sovereign control of other nations. The developing nations argue that they will again be left in the economic lurch. This argument against a right-of-grab-based system gains salience when one considers that the reason the developing nations are not yet space-capable may well be attributable to past wrongs the developed nations inflicted on them. The perpetuation of past wrongs thus makes the right of grab doubly objectionable in the eyes of developing nations.

There are two short answers to this concern. First, the universe, for practical purposes, is **not finite.** Whenever developing nations become space-capable, **there will be plenty of** available **unused** space **real estate.** Second, corporations based in space-incapable nations could, of course, contract out to a space launch company from a space-capable nation. Developing nations can take advantage of space development without themselves being space-capable.

Perhaps less straightforward is the notion that ownership rights, by incentivizing the development of outer space, would fund intense R&D of launch technology. **Launches would become more reliable and cheaper.** In this way, ownership rights might hasten the day that developing nations are able to afford hiring a launch company, or even to have their own space programs (see infra section VII (b)).

### Plan

#### They say the neg is neoliberal. Yes, you’re welcome.

#### Capitalism is the only ethical economic system and has resulted in drastic reductions in structural violence by every empirical metric—most recent data proves

Swan 20

Josh Swan (Policy and Data Analyst for the City Region Economic and Development Institute of the University of Birmingham). “Capitalism and its Impact on Global Living Standards.” City REDI. 18 March 202. JDN. <https://blog.bham.ac.uk/cityredi/capitalism-and-its-impact-on-global-living-standards/>

Fundamentally, it must be said straight away that capitalism has been, and still is, an incredibly overwhelming positive force for the world and is easily the most successful economic system that has ever been produced. Since the time of Karl Marx, the embourgeoisement of populations has led to greater financial and social security, as well as **fulfilling careers** that were once reserved for the elite. With the right saving plan, many will buy their own home, start their own business, save for their pension and enjoy **unprecedented** levels of **leisure time.** Just in case you are still not convinced why this is the single greatest economic system ever invented, let us examine the past. Technology has created more jobs than it has destroyed in the colossal world population boom in the last 144 years. Work is more fulfilling as dull jobs have been automated and creative careers becoming more numerous. Incredible advances in medicine, accountancy and professional services were made under capitalism, and essential products like the television have seen a **98% fall in real-price** since 1950.

Some would say this is a prerequisite to materialism; the making of commodities to fulfil our happiness and needs. You may say, so what if televisions have fallen in value meaning every family, including poor families that live in a home, can afford one? This isn’t a real argument to say it is the best system in the world… this hasn’t made a huge difference to reprimanding the suffering of Humankind. Well, is it enough to say capitalism has **dramatically reduced child mortality** rates and vastly increased the lifespan of old age? If that was not so then how would we explain an exponential world population increase? Whilst medical science has been credited for a positive difference with these two areas, the innovative nature of capitalism and the wealth it generated was able to fund and foster scrutiny of medical ideas which led to successful research. For example, in the Soviet Union, the goal of the central planners was to “catch up with and surpass the West”. Despite the Soviet Union in 1986 having a population 14% larger than the United States, they had 73% more hospitals than the US (23,100 vs 6229), 69% more beds for patients, 48% more physicians and 99% more midwives. However, the average life expectancy was 64 and 73 for males and females in the Soviet Union compared to 71 and 78 for males and females in the United States. It may be telling that despite far fewer staff and hospitals, the United States outspent the Soviets by more than $184 billion in 1979 ($645 billion in today’s money) and the US government paid less than half this amount compared to the 92% share the Soviet Union planners contributed. Capitalism enabled the United States to mobilise and efficiently allocate its resources, as well as create far more efficient hospitals than its rival and was able to show a clear health benefit to its population as a result.

Other areas of living standards have skyrocketed such as education (and female education), skills, information and social mobility. But most of all, capitalism as a form of trade and enterprise has been the engine in the **immense reduction of world** absolute **poverty** as The Guardian writes “In the past 200 years, extreme poverty has collapsed from a whopping 94% of the entire world population to less than 10% today”. **60,000** people **are escaping extreme poverty every day** because of trade. But if capitalism is so good, why are there huge swathes of populations still poor and suffering today? Capitalism isn’t the cause of this poverty but rather that there is a lack of capitalism that affects these areas. Government corruption, war, political instability and other structural problems prevent power being placed into the markets and operating efficiently in these areas.

#### Their deep sea example goes decisively neg—the commons model is horrifically inefficient and destroys productive incentives

Reinstein 99

Ezra J. Reinstein (JD, Associate at Kirkland & Ellis), Owning Outer Space, 20 Nw. J. Int'l L. & Bus. 59 (1999). JDN. https://scholarlycommons.law.northwestern.edu/njilb/vol20/iss1/7

We can learn **how not to solve the problem** from the legal and diplomatic wrangling that has been going on regarding mining of Earth's deep seabed. Exploitation of the deep seabed, like exploitation of space, is a **very risky and expensive** proposition. And the deep seabed, like space, is considered an international zone. In December, 1982, 120 nations signed the LOS.94 The LOS establishes an "Authority" and an "Enterprise." 95 Mining companies must receive approval from the Authority. Approval, in the form of a license, is only granted if the applicant company satisfies a set of **rigorous conditions.** The applicant must present two sites of equal value, one of which will be reserved by the Authority for development by the Enterprise.96 The applicant must fully disclose information regarding mining equipment, methods, and technology.97 The applicant must pay an initial sum of $500,000, an annual fee of $1 million until production begins, and (once mining has begun) either $1 million or a percentage of the market value of recovered materials, whichever is greater.9 Finally, and in addition to any domestic taxes incurred, the Authority levies 35 to 70 percent of the net profits.99

The United States, along with several other industrialized nations including the Federal Republic of Germany, France, Great Britain, Japan, and the Soviet Union, refused to ratify the LOS because of the deep seabed mining provisions. There was a strong perception that the treaty's harsh regulations were an attempt to ruin commercial mining projects that would be in potential competition with the dry-land mines of developing nations. As Marne A. Dubs, spokesperson on seabed mining for the American Mining Congress, saw it, if the LOS was enforced "there will be no U.S. ocean mining industry. Instead, the United States passed a domestic law, the Deep Seabed Hard Mineral Resources Act, which recognized the rights of U.S. mining ventures to the full profits of their labors.

If space law follows the LOS's lead and asks developed nations to make similarly-excessive sacrifices **for the benefit of developing nations**, the same political impasse with the resultant disparate and **incoherent legal regimes** will no doubt reoccur.