# TOC Quarters Neg vs Strath Haven AM

# 1NC

### 1

#### Interpretation—the aff must disclose the plan text, framework, and advantage areas 30 minutes before the round. To clarify, disclosure can occur on the wiki or over message.

#### Graphical user interface, text, application, chat or text message Description automatically generated

#### Vote neg for prep and clash—two internal links—a) neg prep—4 minutes of prep is not enough to put together a coherent 1nc or update generics—30 minutes is necessary to learn a little about the affirmative and piece together what 1nc positions apply and cut and research their applications to the affirmative b) aff quality—plan text disclosure discourages cheap shot affs. If the aff isn’t inherent or easily defeated by 20 minutes of research, it should lose

#### Reject 1ar theory – a) the 2NR must cover substance and over-cover theory, since they get the collapse and persuasive spin advantage of the 3min 2AR, b) their responses to my counter interp will be new, which means 1AR theory necessitates intervention.

### 2

#### Interpretation and violation: Topical affirmatives may not defend satellites as a form of appropriation.

#### Appropriation requires the exclusive use of property with a sense of permanence - satellites don’t meet that criteria.

Gorove 84 Stephen Gorove, Major Legal Issues Arising from the Use of the Geostationary Orbit, 5 MICH. J. INT'L L. 3 (1984). Available at: <https://repository.law.umich.edu/mjil/vol5/iss1/1> //RD Debatedrills

Crucial to a proper analysis of this issue is an understanding of the concept of "appropriation." The term "appropriation" in law is used most frequently to signify "the taking of property for one's own or exclusive use with a sense of permanence." 12 The word" thus indicates something more than just casual use. The question then becomes whether the continued exclusive occupation by a geostationary satellite of the same physical area is a violation of the ban on national appropriation. While a state may certainly exercise exclusive control over a traditional object, such as a ship, or an aircraft, or a part of airspace, it is not clear that a satellite in geostationary orbit would be able to maintain its exact position and occupy the same area over a period of time. 13 Even if a position could be accurately maintained, and thus possibly constitute an "appropriation" within the meaning of article II, the satellite would have to be kept in that orbit with a "sense of permanence" and not on a temporary basis. It has been suggested that the keeping of a solar power satellite in geostationary orbit for a period of thirty years would not constitute appropriation. 14 In point of fact, thirty years would probably satisfy the "sense of permanence" requirement, unless the geostationary orbit were considered a natural resource as characterized by the International Telecommunication Convention of 1973 (ITC) 15 and as claimed by the equatorial countries. Authority exists to support the view that the ban on national appropriation of outer space does not relate to resources. 16 In view of this and the additional fact that solar energy is an inexhaustible and unlimited resource, its utilization for transmission to earth by satellites does not appear to fall under the prohibition of article II of the 1967 Treaty.

#### Orbital slots are a commons – even exclusive use in a first come first serve system cannot constitute property

Matignon 19 [Louis de Gouyon Matignon, PhD in space law from Georgetown University, “ORBITAL SLOTS AND SPACE CONGESTION,” 06/03/19, *Space Legal Issues*, https://www.spacelegalissues.com/orbital-slots-and-space-congestion/, EA]

Near-Earth space is formed of different orbital layers. Terrestrial orbits are limited common resources and inherently repugnant to any appropriation: they are not property in the sense of law. Orbits and frequencies are res communis (a Latin term derived from Roman law that preceded today’s concepts of the commons and common heritage of mankind; it has relevance in international law and common law). It’s the first-come, first-served principle that applies to orbital positioning, which without any formal acquisition of sovereignty, records a promptness behaviour to which it grants an exclusive grabbing effect of the space concerned. Geostationary orbit is a limited but permanent resource: this de facto appropriation by the first-comers – the developed countries – of the orbit and the frequencies is protected by Space Law and the International Telecommunications Law. The challenge by developing countries of grabbing these resources is therefore unjustified on the basis of existing law. Denying new entrants geostationary-access or making access more difficult does not constitute appropriation; it simply results from the traditional system of distribution of access rights. The practice of developed States is based on free access and priority given to the first satellites placed in geostationary orbit.

#### Past international legal precedent is the only way to resolve applications of space law – lack of condemnation via the non-appropriation principle proves sats aren’t T

**Trapp 13** (TIMOTHY JUSTIN TRAPP, JD Candidate @ UIUC Law, ‘13, TAKING UP SPACE BY ANY OTHER MEANS: COMING TO TERMS WITH THE NONAPPROPRIATION ARTICLE OF THE OUTER SPACE TREATY UNIVERSITY OF ILLINOIS LAW REVIEW [Vol. 2013 No. 4])//DebateDrills RD

As commercial space flight becomes more and more prevalent,153 the question of whether private entities can appropriate property in space becomes very important. Whereas once it took a nation to get into space, it will soon take only a corporation, and scholars have pondered whether these entities will be able to claim property in space.154 Though this seems allowable, since the treaty only prohibits “national appropriation,”155 allowing such appropriation would lead to an absurd result. This is because the only value that lies in recognition of a claim is the ability to have that claim enforced.156 If a nation recognized and enforced such a claim, this enforcement would constitute state action.157 It would serve to exclude members of other nations and would thus serve as a form of national appropriation, even though the nation never attempted to directly appropriate the property.158 Furthermore, the Outer Space Treaty also requires that non-governmental entities must be authorized and monitored by the entities’ home countries to operate in space.159 Since a nation cannot authorize its citizens to act in contradiction to international law, a nation would not be allowed to license a private entity to appropriate property in space.160 While this nonappropriation principle is great for allowing free access to space, thereby encouraging research and development in the field, it makes it difficult to create or police a solution to the space debris problem. A viable solution will have to work without becoming an appropriation. There is, however, very little substantive law on what actually counts as appropriation in the context of space.161 So, the best way to see what is and is not allowed is to look both at the general international law regarding appropriations and to look at the past actions of space actors to see what has been allowed (or at least tolerated) and what has been prohibited or rejected.

#### Precision comes first and link turns predictable limits – the resolution is the only predictable stasis point for dividing ground—any deviation justifies the aff arbitrarily jettisoning words in the resolution at their whim which decks negative ground and preparation

#### Limits and ground— private satellites serve hundreds of distinct purposes, any one of which can be an aff that lack generic neg ground – NC3, ADR, weather observation, advertisements, internet, GPS, space stalkers, etc. The counterinterp also justifies dozens of other non exclusive uses of outer space – probes, weapons, spaceships, etc. Limits ow – it controls the negative’s ability to engage which is a prerequisite to any external benefit of debate.

### 3

#### 1] Interp – the Affirmative may not condition the act of Appropriation in the Plan on a potential effect of such Appropriation.

#### 2] Violation – the Aff conditions removing Appropriation on that appropriation’s use for 5G

#### 3] Standards:

#### a] Negative Ground – Aff’s that condition on potential Effects artificially fiat Internal Links – makes it impossible for us to mitigate the 1AC Advantages since they’re functionally fiat-ing U/Q and ANY press we’ll make will just be answered with either “doesn’t apply” or “the Plan only applies IF it does”. This zeros Neg Ground since anything that competes HAS to bite the Aff – allowing Affs to condition on effects forces both a] allows the Aff to irreparably be ahead in Impact Calculus since they don’t have to worry about Internal Link or U/Q and b] incentivizes teams to condition on Impacts that are impossible to contest like Affs that condition on Appropriation not being Racist or Oppressive.

#### b] Limits – There’s an infinite amount of conditions/possible effects on infinite appropriation – Neg Link debating HAS to be specific to the Condition – means Appropriation Good doesn’t spill-down – explodes predictable stasis of the topic.

### 4

#### CP Text: Lunar Embassy should file space property disputes with private Chinese entities engaging in appropriation of outer space for 5G. When hearing cases over outer space property disputes, courts should rule that the appropriation of outer space by Chinese private entities in outer space for 5G purposes constitutes a piratical act under the Law of the Sea and that the nation is obliged to invoke universal jurisdiction against space piracy. Nations should abide by and enforce this ruling.

#### That solves and re-invigorates universal jurisdiction

**Flenniken 20** (Sara Raye, received her J.D. in May 2020 from the University of Florida Levin College of Law where she focused on environmental law. “Ad Astra Per Maris: Using the Law of the Sea to Protect the Space Environment”, 44 Journal of Space Law 250 (2020)DR 22

One of the foreseeable legal issues in space is private companies that refuse to associate with any one nation and claim that, because they are not government agencies, the current laws do not apply to them. In their attempt to evade regulation, however, these companies also surrender the protections afforded to government agencies of a nation. In this respect, private space companies that decline to adhere to the regulations in place are effectively operating as pirates. **Piracy** on the high seas is one of the oldest and most well-attested examples of universal jurisdiction, under which each individual nation contributes to the collective welfare and interests of all nations. 122 Under the law of the sea, pirates are treated as outlaws and are thus denied the protections of the flag State. 123 Without these protections, they may be apprehended and prosecuted by any nation and the prosecuting nation is free to determine the actions taken and the penalties imposed. 124 Private space companies that choose to operate outside of the laws in place should be regarded similarly. In Article 109, the Law of the Sea Convention addressed a similar issue, that of so-called "pirate radio" ships, which illegally broadcast over radio waves from the high seas. 126 While these ships do not meet the traditionally understood definition of pirates, by international authorities, they are considered pirates nonetheless. 126 The United Nations Security Council has urged all nations to criminalize piracy under domestic law to ease subsequent prosecution, and has explicitly recognized piracy as a crime subject to universal jurisdiction.1 27 Moreover, the Law of the Sea Convention places an explicit obligation on every nation to cooperate with the suppression of piracy to the fullest extent that it is able, 128 including the suppression of "pirate radio" ships 129 and this should be mirrored in space law as well.

#### The CP allows for short-term private appropriation so ownership disputes go to court but has courts rule that private entities are pirates

**Listner 3** (Michael, J.D. Regent University School of Law, 2001; B.S. Computer Information Systems, Franklin Pierce College, 1998. The author was a founding member of the Regent University Maritime Law and International Trade Society; a board member of Alternative Dispute Resolution and Client Counseling Board 2001; and a student member of the James Kent American Inn of Court 2000-01. “The Ownership and Exploitation of Outer Space: A Look at Foundational Law and Future Legal Challenges to Current Claims,” 1 REGENT J. INT'l L. 75 2003)DR 22

While the four major space law treaties lay out the law concerning the ownership and activities of nations in space, they have left gaps where individual persons or legal entities are concerned. UNCOPOUS attempted to rectify this through the provisions of the Moon Treaty. However, it is of little value while the U.S. and the Russian Federation continue to refuse to sign it.' 39

The fact that **a loophole** allowing private entities to own extraterrestrial property **still exists** in the Outer Space Treaty has motivated one private corporation to enter into the business of selling real estate on the Moon and other extraterrestrial property within the confines of our solar system.140 Lunar Embassy was founded in 1980 by Dennis M. Hope to sell parcels of celestial property to private entities.' 4 ' To form a legal basis for passing good title to private entities for the property they sell, Lunar Embassy filed a declaration of ownership with the U.S. government. 42 Subsequently, Lunar Embassy also informed the U.N. and the Russian Federation of its claim; a claim which has never been contested. 143

For the price of $19.99 plus a minimal tax and handling fee, a private entity can purchase a one acre parcel of lunar property from Lunar Embassy.' 44 When it first began sales of lunar property, the first 150,000 purchasers of 1777.58 acre lots were guaranteed to receive all minerals rights to their parcel. 1 5 Additionally, the individual will receive a lunar site map, a lunar constitution outlining the laws and rights of an owner of lunar property, and a short story entitled "You Own What?". 46 The company has been selling lunar real estate since 1996. The **legal validity of such ventures** remains untested, leaving the numerous **legal questions** that it evokes **unanswered**. For example, Lunar Embassy believes that by filing a declaration of ownership with the U.S. government, it has a created a legal basis for ensuring its customers can claim ownership of the property it sells to them. 47 However, it is unclear upon which legal theory of property law they are relying.14 8

Since there has been **no legal action** on behalf of any of the signatories of the Outer Space Treaty regarding such a claim, one might presume that **it is considered legitimate**. On the other hand, it may be that no signatory feels the case is sufficiently ripe to file suit. 149 The U.N., the Russian Federation, and even the U.S. government could conceivably file suits challenging the veracity of Lunar Embassy's claims at a future date.

The problem of title could be further complicated in the event that citizens of other countries purchase extraterrestrial real estate from a U.S. corporation, i.e., Lunar Embassy. What happens when this purchaser's home country is not a signatory of the Moon Treaty?1 5 0 Does that country's obligation to the Moon Treaty trump any private ownership right the individual might have, or can the individual still claim title operating under the umbrella of Lunar Embassy's authorization from the U.S.?

Aside from the problem of title to lunar property, there is the problem of enforcement. For example, suppose that a private individual from a country that has not recognized the Moon Treaty claims the same piece of extraterrestrial property that an individual from the U.S. has purchased from Lunar Embassy. How is the conflict of title resolved? Clearly the U.S. could not enforce the private claim purchased through Lunar Embassy since the U.S. cannot claim territorial jurisdiction. 15 ' Furthermore, any attempt to enforce a private claim through the **private use of force**, (force without the delegated authority of a sovereign government), could be **construed as** the space equivalent of piracy on the high seas.152 Even if the private owners attempted to use force, the U.S., being the nation responsible for Lunar Embassy's activities, could be considered as sponsoring piracy or possibly terrorism by allowing them to do so.' 53

The most obvious threat to Lunar Embassy and its customers would be the ratification of the Moon Treaty or a derivative by the U.S. and other developed countries. 154 The ratified treaty would be the constitutional equivalent of a federal statute. 55 However, the U.S. Constitution could be used in U.S. courts to find that such a treaty provision was unconstitutional 56 based on the action being construed as a "taking" under the Fifth Amendment.157

Alternatively, a federal statute promulgated after ratification of this kind of a treaty would prevail over the treaty itself. 58 Sufficient lobbying could persuade the U.S. Congress to promulgate a statute that would prevail over such a treaty, thereby preserving any title to extraterrestrial property rights that otherwise might be invalidated by the treaty. Presuming that title to extraterrestrial property is valid, and the means become available to reach the moon and other celestial bodies, the jurisdictional issue involved in a legal challenge and the question of which laws to apply to the facts become prominent issues. According to the Outer Space Treaty, while no nation can extend its sovereignty to outer space, 5 9 it does hold member states responsible for overseeing the outer space activities of non-governmental entities. 1 60

Perhaps Dennis Hope and Lunar Embassy are attempting to establish sovereignty for their own self-proclaimed principality 16 ' by providing a constitution' 62 that outlines laws and rights for that particular celestial body claimed by Lunar Embassy. 1 63 However, in the absence of a Lunar Embassy constitution that provides a forum selection clause and remedies for torts, criminal activity, or other infractions committed against extraterrestrial property owners, the question of jurisdiction is still a valid one.

While the Outer Space Treaty vests jurisdiction over space objects in the state of registry,164 the private physical possession of extraterrestrial property was not presupposed in its drafting.165 However, U.S. federal courts, **in cases where U.S. citizens own** extraterrestrial property**,** **could** potentially assume jurisdiction. In deciding a case involving a tort claim that arose in Antarctica, the United States Court of Appeals for the District of Columbia Circuit referred to Article VIII of the Outer Space Treaty and recognized that while "[t]he Space Treaty is obviously not couched in terms of tort claims, the basic principle is that in the sovereignless reaches of outer space, each state party to the treaty will retain jurisdiction over its own objects and persons."' 66 Therefore, it is reasonable to conclude that even if Lunar Embassy provides a forum selection clause or methods of dispute resolution in its laws and constitutions, it, along with those property owners who are U.S. citizens, would likely have to bring their disputes in a U.S. federal court. While such legal action may seem far-fetched given the current realities of space travel, there exists the potential for an action of trespass on, and conversion of, moon property within the next few years that could determine the **veracity** of **the legal title** of the moon held by Lunar Embassy and its customers.

Applied Space Resources is sponsoring the Lunar Retriever I mission,' 67 a commercial venture with the goal of sending a lander to the Moon; retrieving a quantity of lunar soil; and returning it to earth where it would be sold for profit. The company bases the legality of its plans on the precedent set by the former Soviet Union's sale of a small sample of lunar material that it obtained from an unmanned probe.1 68

**Here is how** one scenario might develop. **Lunar Embassy** has claimed ownership of the moon and sold certain parcels of its surface to private entities. Since the validity of the title held by Lunar Embassy has not been challenged, it and its customers could seek an injunction against Applied Space Resources to prevent such **a mission**. They could claim that Applied Space Resources must have the permission of the entity holding constructive title to the applicable parcel of the moon's surface before landing its probe and retrieving lunar material. To do so **without permission** is arguably trespass of land and conversion of property. 69 Such a challenge to Applied Space Resources' mission could gain judicial approval for Lunar Embassy's and its customers' title claims.

Commencement of such a suit could be accomplished in several ways. **Lunar Embassy could file suit** against Applied Space Resources as **a corporate entity** or the entities that purchased property from it could file suit.' 70 The plaintiffs in such a suit would be expected to have standing to appear before the Court. To prove standing, they could claim that there is an imminent threat of irreparable injury from trespass to property and conversion. The court could grant a remedy in the form of an injunction barring Applied Space Resources from carrying out their mission without permission from Lunar Embassy or the entity that holds title.' 7 ' Applied Space Resources could cross file a motion **to challenge the validity** of title to the moon held by Lunar Embassy and its customers, or file a separate motion for a declaratory judgment 172 **to determine** whether Lunar Embassy and its customers hold a valid property right to the land they claim over the moon.

**However**, a legal challenge is always fraught with danger and a case such as this is no exception. Lunar Embassy and its customers face the very real possibility of having their legal claim to the moon and other celestial bodies in the solar system declared void, as well as the possibility that a court may rule that the collection of lunar soil samples for profit runs contrary to international law and is **prohibited**.

Further, if a federal court **denied** the private **ownership claims** of Lunar Embassy and its customers, **it could give** proponents **of the Moon Treaty** a much needed boost towards its ratification and general acceptance of its principles, 73 **or** it may **give the signatories** the incentive to press ahead with legal action of their own.

Specifically, the signatories of the Moon Treaty could bring suit against the U.S. under the Outer Space Treaty in the International Court of Justice and ask for an injunction requiring the U.S. to suspend its authorization 74 to commercial ventures involving the exploitation of outer space in regards to ownership and removal of soil from celestial bodies, including the moon and its soil. Such a suit could lead to a legally binding interpretation of the right to private ownership of real property located in outer space. Conversely, the U.S. might seek an amendment to the Outer Space Treaty to reverse such a finding by the International Court of Justice, or they could simply ignore the ruling as one of the most powerful nations in the world today.' 75 More ominous, is the possibility that the U.N. could declare a moratorium on all commercial ventures that seek to exploit real property in space until a final resolution on space property rights is reached.

**Such a suit could** potentially solidify Lunar Embassy's claim to celestial body titles, provide the first case of space law that deals with the private ownership rights, and would set a much needed precedent. Perhaps an initial firestorm of litigation is necessary to advance the jurisprudence of outer space, as no cases have been brought before the International Court of Justice dealing with the space law treaties; and domestic space law cases in the U.S. have been limited to liability issues surrounding satellite launches.1 76 Furthermore, positive domestic precedent would give the U.S. more leverage in negotiating for a Moon Treaty redraft with its signatories and thwart future suits by other countries.

#### Anti-piracy failing now and is key to achieving SDGs—new rulings that require universal jurisdiction solve

**Jin and Techera 21** (Jing Jin, Guanghua Law School, Zhejiang University, Hangzhou 310008, China. [Erika Techera](https://sciprofiles.com/profile/author/d2hXNGM2MlNHTWg2YU1XaUxIUnRWSzFnOEY2cXV2dGRncldQc1N5WmVybz0=), Law School, The University of Western Australia, Perth 6009, Australia “Strengthening Universal Jurisdiction for Maritime Piracy Trials to Enhance a Sustainable Anti-Piracy Legal System for Community Interests” *Sustainability* 2021, 13(13), 7268 June 29 2021)DR 22

Somali piracy has revealed the shortcomings of domestic piracy legislation in many States [[113](https://www.mdpi.com/2071-1050/13/13/7268/htm#B113-sustainability-13-07268)]. Naval forces were often forced to **release suspects** without any sanctions, no matter whether there was sufficient evidence to prosecute them or not [[9](https://www.mdpi.com/2071-1050/13/13/7268/htm#B9-sustainability-13-07268)]. That has weakened the international efforts **against** Somali **pirates** [[53](https://www.mdpi.com/2071-1050/13/13/7268/htm#B53-sustainability-13-07268)]. Failure to criminalize piracy and to establish universal jurisdiction in domestic law **directly results in the lack of a basis for combating piracy** at the national level. Even in States that have criminalized piracy and established universal jurisdiction over piracy in their domestic law, there are still various deficiencies in the legislation.

First, the definition of piracy is not uniform among States’ domestic legislation and between domestic law and international law. Scholars have analyzed the definition of piracy in 19 States and regions and found that only 21.2% held two ships requirements; 31.6% required “private ends”; and 26.3% required that piracy occurs outside the scope of national jurisdictions [[114](https://www.mdpi.com/2071-1050/13/13/7268/htm#B114-sustainability-13-07268)]. This inconsistency will lead to operational difficulties in applying universal jurisdiction. Even if an act constitutes “piracy” under domestic law, it does not necessarily mean that universal jurisdiction applies, and there is a need to distinguish whether the so-called “piracy” conforms to the UNCLOS definition. This also means that, if the State signs a new international instrument on piracy with the requirement to implement the instrument in its domestic law, it has to distinguish the applicable part from the existing domestic “piracy” definition first and then amend the domestic law relevant to this part to comply with the instrument. That will increase the difficulty of implementation and can easily confuse.

Second, the sentences imposed on pirates vary greatly between States. The universal jurisdiction prosecutions over piracy are public goods that serve the whole international community [[115](https://www.mdpi.com/2071-1050/13/13/7268/htm#B115-sustainability-13-07268)]. Consequently, it is necessary to analyze the sentences for piracy in different States comparatively. Sentences for similar crimes should not differ largely, otherwise they can lead to unfairness [[116](https://www.mdpi.com/2071-1050/13/13/7268/htm#B116-sustainability-13-07268)]. However, as of 2010, the longest maximum sentence was a life sentence (e.g., in the US, UAE, and Kenya), and the maximum sentence in Seychelles was 30 years, while the ones in Europe were significantly shorter (e.g., 15 years in Germany; 12 or 15 in Holland; 14 or 20 in Italy) [[116](https://www.mdpi.com/2071-1050/13/13/7268/htm#B116-sustainability-13-07268)]. In practice, the sentences for similar piracy offences range from a life sentence to 4.5 or 5 years [[116](https://www.mdpi.com/2071-1050/13/13/7268/htm#B116-sustainability-13-07268)].

Third, the domestic legal basis for universal jurisdiction over piracy is not well established. Many States have not fully adopted domestic legislations and a jurisdictional framework based on the concept of universal jurisdiction stipulated in UNCLOS [[117](https://www.mdpi.com/2071-1050/13/13/7268/htm#B117-sustainability-13-07268)]. Some States tend to exercise universal jurisdiction only when certain links exist [[61](https://www.mdpi.com/2071-1050/13/13/7268/htm#B61-sustainability-13-07268)]. In this respect, it seems that other traditional jurisdiction principles are enough to meet the needs of States to combat piracy, if they are not interested in punishing piracy that has no nexus with them. According to Jack Lang, in light of general international law, the State of nationality of the pirates, the State of nationality of the victims, and the flag State of any ship concerned can claim jurisdiction over the suspected pirates [[23](https://www.mdpi.com/2071-1050/13/13/7268/htm#B23-sustainability-13-07268)]. However, as ships on the high seas are generally considered to be under the exclusive jurisdiction of the flag State, with the universal jurisdiction over piracy and a few other circumstances as exceptions [[103](https://www.mdpi.com/2071-1050/13/13/7268/htm#B103-sustainability-13-07268)], whether there is still the space for other traditional jurisdiction is confusing. Moreover, by using a flag of convenience, the flag State may not be the State of the company that genuinely owns or operates the ship. The legal link between the latter State and the piracy incident may be weak. Therefore, some States prosecute pirates having nexus with them on the ground of universal jurisdiction. For example, Japan’s first piracy trial, which involved an attack on a Bahamian ship operated by a Japanese company, applied universal jurisdiction [[118](https://www.mdpi.com/2071-1050/13/13/7268/htm#B118-sustainability-13-07268)]. A similar but confusing situation existed in the Republic of Korea v. Araye, the first trial of Somali pirates in Korea related to the piracy attack on a Maltese ship operated by a Korean company [[119](https://www.mdpi.com/2071-1050/13/13/7268/htm#B119-sustainability-13-07268)]. The jurisdiction ground of the case is controversial. The court ruled that, according to the domestic criminal procedure law, it has territorial jurisdiction over the case due to the current location of the defendant [[19](https://www.mdpi.com/2071-1050/13/13/7268/htm#B19-sustainability-13-07268)]. One scholar believes that Korea does not recognize universal jurisdiction, and only when the suspected pirates are Korean nationals or the piracy takes place on a Korean ship can they be prosecuted for piracy in its domestic courts [[120](https://www.mdpi.com/2071-1050/13/13/7268/htm#B120-sustainability-13-07268)]. However, other scholars regard the trial as a typical case in which Korea exercised universal jurisdiction over piracy [[19](https://www.mdpi.com/2071-1050/13/13/7268/htm#B19-sustainability-13-07268)]. This issue is important because if there is a positive conflict of jurisdiction, the jurisdiction principles the State applies may affect the priority of different jurisdictions because universal jurisdiction is often considered to be subsidiary [[121](https://www.mdpi.com/2071-1050/13/13/7268/htm#B121-sustainability-13-07268)]. Moreover, if the seizing State does not recognize the jurisdiction ground proposed by other States, it will not cooperate [[122](https://www.mdpi.com/2071-1050/13/13/7268/htm#B122-sustainability-13-07268)]. For example, if the seizing State believes that only flag State jurisdiction and universal jurisdiction are applicable to piracy, and does not recognize other traditional jurisdiction claims, it will not transfer pirates. However, in the current situation of the overall negative conflict of jurisdiction over piracy, regardless of the jurisdiction ground applied, it usually will not incur protests from other States. In special circumstances, it may restrain interested States from asserting jurisdiction over a whole case. In the Republic of Korea v. Araye, because the criminal law of Korea does not clearly provide for universal jurisdiction, there was a debate about whether the criminal acts against foreign crew can be applied under Korean law [[123](https://www.mdpi.com/2071-1050/13/13/7268/htm#B123-sustainability-13-07268)]. Those acts against foreign crew were not ultimately prosecuted [[119](https://www.mdpi.com/2071-1050/13/13/7268/htm#B119-sustainability-13-07268)]. From a global perspective, universal jurisdiction is a justice-based measure [[124](https://www.mdpi.com/2071-1050/13/13/7268/htm#B124-sustainability-13-07268)] and an important means to protect global public goods [[121](https://www.mdpi.com/2071-1050/13/13/7268/htm#B121-sustainability-13-07268)]. Although it is not a legal obligation to establish and exercise universal jurisdiction over piracy, as Cedric Ryngaert claims, there are many jurisdiction principles so that at least one can be applied in any given situation [[121](https://www.mdpi.com/2071-1050/13/13/7268/htm#B121-sustainability-13-07268)]. Positively asserting jurisdiction can be regarded as a responsibility of States in some circumstances [[122](https://www.mdpi.com/2071-1050/13/13/7268/htm#B122-sustainability-13-07268)]. Without a clear stipulation of universal jurisdiction over piracy, **negative conflicts** of jurisdiction will undoubtedly occur, which is **not conducive** to the solution of global problems and the realization of SDG 16 (Peace, Justice and Strong Institutions). Fourth, domestic legislation lacks procedural provisions on extraterritorial law enforcement. For instance, in the Republic of Korea v. Araye, the pirates claimed that their transfer to Korea lacked a proper procedural basis [[19](https://www.mdpi.com/2071-1050/13/13/7268/htm#B19-sustainability-13-07268)]. Generally speaking, the essential procedural elements, such as time of detention, the treatment and the rights of pirates in the transfer, the procedures for boarding, and visiting and evidence collection processes, have rarely been included in the domestic law. Failure to deal with those issues may lead to violations of human rights. In the case of Hassan and Others, France was charged with illegality due to the extent of time the alleged pirates were kept in detention [[125](https://www.mdpi.com/2071-1050/13/13/7268/htm#B125-sustainability-13-07268)]. The French courts tried to explain this with “wholly exceptional circumstances”, but the European Court of Human Rights decided that there had been a violation of the right to liberty and security in that case [[125](https://www.mdpi.com/2071-1050/13/13/7268/htm#B125-sustainability-13-07268)].

Fifth, domestic legislation may be unable to meet new trends in exercising universal jurisdiction. The separation of seizing, prosecuting, and imprisoning stages, the proposal of new piracy trial options, and enhanced international cooperation all mean that the exercise of universal jurisdiction is no longer limited to the conduct of a single State. Therefore, cooperation with other States and other international entities (including international organizations and international or regional tribunals) is hindered by differing domestic legislative regimes. Harmonizing the law between States will assist with maritime law enforcement cooperation, the transfer and reception of pirates, the identification of evidence collected by other States, and the application of law before and after the transfer of pirates, which are rarely reflected in existing domestic legislation. Efforts to harmonize laws between jurisdictions can have the further benefit of enhancing global best practice.

5. Balanced Relationships to Be Sought in Strengthening Universal Jurisdiction over Piracy to Enhance a Sustainable Anti-Piracy Legal System

In order to sustain a strong anti-piracy legal system, incremental enhancements are needed to support universal jurisdiction over piracy, including the achievement of a better balance in the three key areas explored below.

5.1. Balance between Benefits and Costs

The exercise of universal jurisdiction over piracy is regarded as a public good [[**115**](https://www.mdpi.com/2071-1050/13/13/7268/htm#B115-sustainability-13-07268)]. Although repressing pirates, the hostis humani generis [**126**], benefits all humankind, for the States that exercise universal jurisdiction over piracy, their benefits may be indirect and limited. Many States have a low passion for **prosecuting pirates** who do not directly harm their nationals or national interests [**127**] since exercising **universal jurisdiction over piracy** does not directly safeguard the interests of the **States**. Even the flag State of the attacked ship and the State of nationality of the kidnapped crew may be not active in intervening or prosecuting piracy [**23**,**128**]. In the international community, a State **rarely** receives **financial reward** for providing such public good. The State’s gains in other areas are not significant either. The data show that the exercise of the legislative jurisdiction of universal jurisdiction over piracy—namely, the domestic anti-piracy legislation—does not protect the ships flying the State’s flag from pirate attack [**113**].

The high costs of exercising universal jurisdiction is an important aspect. All the costs for piracy prosecutions, including but not limited to the costs of the trial and imprisonment, evidence and witnesses, translation and logistics, shall be borne by the State exercising universal jurisdiction, unless there are special arrangements on external assistance. The State exercising universal jurisdiction may also have to bear other risks alone, such as Kenya’s intention to withdraw from the handover agreement to receive pirates in March 2010 when it claimed that it was threatened with retaliation from pirates’ allies [**23**]. In this regard, a large number of regional States that exercise universal jurisdiction over pirates in combating Somali piracy have proposed that they need to share the burden of imprisonment with third States [**46**] or hope to send pirates back to Somalia to serve their sentences [**128**] and do not bear the costs of repatriation of suspected pirates who have not been convicted [**46**]. However, the State of nationality of the pirate does not always cooperate effectively on the imprisonment issue. Somaliland, a region in Somalia that was dominated by its own authorities, once withdrew from the agreement on accepting convicted pirates from Seychelles and released the pirates in Hargeysa prison without explanation [**128**].

The imbalance of cost-sharing is another important reason. At present, universal jurisdiction over piracy is usually understood as a kind of right, **rather than an** obligation. Therefore, the subject of responsibility for exercising the jurisdiction to fight against pirates is not clear. Although all States have the right to exercise universal jurisdiction over piracy, they often **take a negative attitude because** of the convenience of giving up their rights and their belief that they are not the most appropriate providers of the public goods. This, in turn, **undermines** the enthusiasm of States that have already provided public goods, thus forming a vicious circle. In 2010, Moses Wetangula, then Kenya’s foreign minister, said, “We discharged our international obligations. Others shied away from doing so. And we cannot bear the burden of the international responsibility [[**129**](https://www.mdpi.com/2071-1050/13/13/7268/htm#B129-sustainability-13-07268)].” If only a few States continue to work hard without sharing the burden, problems will inevitably arise [[**23**](https://www.mdpi.com/2071-1050/13/13/7268/htm#B23-sustainability-13-07268)].

It can be predicted that **it is unrealistic to expect** the State to actively invest too much in exercising universal jurisdiction over **piracy** before the status quo of benefits and costs **changes**. From the perspective of benefits, the States that have relatively more benefits from universal jurisdiction over piracy are those with interests in pirate attacks. In addition to calling on all States to exercise universal jurisdiction over piracy and to prosecute and imprison pirates [[**56**](https://www.mdpi.com/2071-1050/13/13/7268/htm#B56-sustainability-13-07268)], the UNSC further points out the more appropriate States to exercise universal jurisdiction, which are particularly the flag, port, and coastal States; States of nationality of victims and perpetrators of piracy; and States with relevant jurisdiction under international law and domestic legislation [[**53**](https://www.mdpi.com/2071-1050/13/13/7268/htm#B53-sustainability-13-07268)]. However, the UNSC can only use the non-mandatory phrase “call upon”, and whether to respond to the call depends on States themselves. Additionally, great powers also have a certain advantage in gaining benefits from providing public goods. Great powers are often the key factor in determining war and peace, and they also bear greater responsibility for regional and world peace and development [[**130**](https://www.mdpi.com/2071-1050/13/13/7268/htm#B130-sustainability-13-07268)], and therefore, they should make greater contributions to global governance. Although there may not be a direct interest relationship between a specific pirate attack and a great power, and there is no direct economic benefit, the exercise of universal jurisdiction over piracy helps the State to show its power and manners, so as to enhance its international image and voice. Therefore, it is necessary to **encourage** more interested **States** and great powers to provide the public goods needed in **exercis**ing universal jurisdiction over piracy.

From the perspective of costs, the absolute costs of exercising universal jurisdiction over piracy are almost fixed. It seems more appropriate to reduce the relative costs and share the costs. The same costs will put more pressure on weaker States, such as Somalia and regional States, than on more powerful States. This is not only because the same costs account for a larger proportion of the economic aggregate in weaker States but also because these States lack the infrastructure needed to exercise universal jurisdiction over piracy, such as a comprehensive legal system, qualified judicial personnel, adequate prison facilities, etc., which are needed to meet the corresponding requirements through new or large-scale improvement, with a large marginal cost. In the more powerful States, such infrastructure is usually relatively fit for purpose and need only be directed or slightly adjusted to be used for exercising universal jurisdiction over piracy; thus, the marginal cost is smaller. In terms of cost-sharing, providing financial and capacity-building support to States exercising universal jurisdiction over piracy can directly reduce and distribute the costs. During the period of countering Somali piracy, the support of the international community to Somalia and regional States, the Trust fund to Support Initiatives of States Countering Piracy off the Coast of Somalia under the auspices of the Contact Group on Piracy off the Coast of Somalia, and the IMO Djibouti Code Trust Fund initiated by Japan are all types of arrangements that objectively and effectively promoted the piracy trials in Somalia and regional States. Moreover, enabling more States to exercise universal jurisdiction over piracy can spread the burden on a global scale and avoid concentrating the costs of activities benefiting the whole international community on a few States. Jack Lang, the Special Adviser to the Secretary-General of the UN on legal issues related to piracy off the coast of Somalia, said in his report that only with the participation of all States can the commitment of each State be strengthened, and he affirmed that the Netherlands still exercises universal jurisdiction over piracy without directly involving its national interests, saying that “**continuing such mobilization is essential**” [[**23**](https://www.mdpi.com/2071-1050/13/13/7268/htm#B23-sustainability-13-07268)]. Although it is not realistic to require all States to exercise universal jurisdiction over piracy in the short term, it is an effective direction to take to increase the providers of such public goods as much as possible.

5.2. Balance between Right and Obligation

To a certain extent, increasing the costs of refusing to exercise universal jurisdiction over piracy will enhance the willingness of States to **exercise such jurisdiction**. To regard **universal jurisdiction over piracy** as an obligation is an approach. Different from the pure welfare rights, the necessity and urgency of exercising universal jurisdiction in anti-piracy activities is obvious. The high seas have the characteristic of not belonging to the jurisdiction of a single State “but within the collective responsibility of all States”; thus, crimes on the high seas must be properly dealt with through a coordinated and comprehensive approach [**131**]. In other words, as far as a single State is concerned, **it has no legal obligation to exercise universal jurisdiction over piracy;** however, as far as the international community as a whole is concerned, the exercise of such jurisdiction is an essential measure to safeguard the common interests, which cannot be avoided blindly. While recognizing that the exercise of universal jurisdiction over piracy is an optional right, Jack Lang also pointed out in his report that although UNCLOS uses the phrase “to the fullest possible extent” to limit the obligation of cooperation in combating piracy, such flexibility should not be used as an excuse for not prosecuting [**23**].

However, such implied obligation attribute is not conducive to the effective implementation of universal jurisdiction over piracy. SUA has provisions on compulsory jurisdiction and facultative jurisdiction. In the case of compulsory jurisdiction, each State Party has the obligation to establish the corresponding jurisdiction. In the case of facultative jurisdiction, State Parties can decide whether to establish the jurisdiction for the corresponding offences [[102](https://www.mdpi.com/2071-1050/13/13/7268/htm#B102-sustainability-13-07268)], which is more similar to a right enjoyed by State Parties. According to the Legal Committee of IMO, **most** of the State **Parties** of SUA **incorporate** compulsory jurisdiction into their domestic legislation **but lack provisions on facultative jurisdiction** [[117](https://www.mdpi.com/2071-1050/13/13/7268/htm#B117-sustainability-13-07268)]. This comparison shows **the importance** of explicitly stipulating that it is an obligation to exercise jurisdiction.

Although a SUA offence does not always coincide with piracy, to some extent, the establishment of compulsory jurisdiction in domestic law still reflects the willingness of States to bear the responsibility of combating maritime crimes at sea. The increase and then reduction of Somali piracy makes the international community more aware of the importance of participating in international cooperation against piracy and undertaking corresponding international responsibilities. The signing of regional anti-piracy legal instruments, such as ReCAAP, DCoC, Yaoundé Code of Conduct, and MOWCA MOU, further reflects the initiative of the international community in combating piracy. On this basis, it is feasible to set the exercise of universal jurisdiction over piracy as an obligation under certain conditions.

In terms of the content of the obligation, there are differences in the exercise of legislative jurisdiction, law enforcement jurisdiction, and judicial jurisdiction. There is a view that the national legislation on piracy is an obvious prerequisite for the implementation of “the obligation to cooperate in the suppression of piracy” in Article 100 of UNCLOS [[132](https://www.mdpi.com/2071-1050/13/13/7268/htm#B132-sustainability-13-07268)]. The obligation of legislative jurisdiction is very common in international legal instruments, such as SUA, International Convention against the Taking of Hostages, and UN Convention against Transnational Organized Crime, which all require State Parties to take necessary measures to establish jurisdiction over related crimes. Therefore, if a new anti-piracy international legal instrument is concluded, there is no technical difficulty in establishing universal jurisdiction over pirates in domestic law as the obligation of State Parties.

The enforcement of universal jurisdiction over piracy has its particularity. It usually occurs on the high seas or in any other place outside the jurisdiction of any State. The vast geographical scope makes it unrealistic to obligate a State to exercise law enforcement jurisdiction over every piracy case as it exercise jurisdiction over criminal offences committed within its territory. Whether law enforcement can be actually carried out on the high seas or in any other place outside the jurisdiction of any State and its enforcement effect depends on many factors, such as the strength of a State’s Navy or Coast Guard, the comprehensive strength of the State, the specific situation of the pirate attack, etc. Additionally, in the absence of a unified and authoritative global governance institution, it is obvious that there is no international treaty, customary law, and legal basis for requiring any State to undertake the obligations of “international police” on the global commons such as the high seas or any other places outside the jurisdiction of any State. Therefore, the enforcement jurisdiction should still exist in the form of rights.

The judicial jurisdiction over piracy can be **compulsory** in the form of “extradition or prosecution”. The primary purpose is **to put an end to** the phenomenon of “capture release” or “only drive but not capture” and **ensure** that pirates are subject to judicial trials. Secondly, the “extradition or prosecution” of pirates is in line with the current State practice of transferring pirates to a third State for trial in the process of fighting against Somali pirates.

5.3. Balance between Innovation and Stability

The global governance of the ocean needs to respond to changing, new, and emerging issues through the creation of new **governance rules** according to new circumstances, new requirements, and new trends in ocean affairs. The development of law should be a continuous and dynamic process. The better way to protect common interests through international law is to adapt rather than to abandon the **existing legal systems**, and revolutionary new concepts should be constituted consistent with the recognized legal frameworks [[133](https://www.mdpi.com/2071-1050/13/13/7268/htm#B133-sustainability-13-07268)]. Turning to the reform of the legal system of universal jurisdiction over piracy, it is mainly reflected in the balance between the innovative anti-piracy legal measures and the existing relevant provisions of UNCLOS, as well as the balance between the exercise of universal jurisdiction and respect for national sovereignty.

#### SDGs are leverage points that solve extinction BUT failure causes cascading risks that cumulatively outweigh any single risk, causing extinction.

Fenner and Cernev ‘20 [Richard Fenner; Jan. 2020; Director of the MPhil in Engineering for Sustainable Development at Cambridge; Australian National University, Canberra, Australia; “The importance of achieving foundational Sustainable Development Goals in reducing global risk,” Volume 115, https://www.sciencedirect.com/science/article/pii/S0016328719303544]

Fig. 3 demonstrates that cascade failures can be transmitted through the complex inter-relationships that link the Sustainable Development Goals. Randers, Rockstrom, Stoknes, Goluke, Collste, Cornell, Donges et al. (2018) have suggested that where meeting some SDGs impact negatively on others, this may lead to “crisis and conflict accelerators” and “threat multipliers” resulting in conflicts, instability and migrations. Ecosystem stresses are likely to disproportionately affect the security and social cohesion of fragile and poor communities, amplifying latent tensions which lead to political instabilities that spread far beyond their regions. The resulting “bad fate of the poor will end up affecting the whole global system"(Mastrojeni, 2018). Such possibilities are likely to go beyond incremental damage and lead to runaway collapse.

The World Economic Forums’ Global Risks Report for 2018 shows the top five global risks in terms of likelihood and impact have changed from being economic and social in 2008 to environmental and technological in 2018, and are closely aligned with many SDGs (World Economic Forum, 2018). The report notes “that we are much less competent when it comes to dealing with complex risks in systems characterised by feedback loops, tipping points and opaque cause-and-effect relationships that can make intervention problematic”. The most likely risks expected to have the greatest impact currently include extreme weather events natural disasters, cyber attacks, data fraud or theft, failure of climate change mitigation and water crises.

These are represented in Fig. 3 by the following exogenous variables. “Climate change” drives the need for Climate Action (SDG 13), “Cyber threat” may adversely impact technology implementation and advancement which will disrupt Sustainable Cities and Communities (SDG 11); Decent Work and Economic Growth (SDG 8) and the rate of introduction of Affordable and Clean Energy (SDG 7), with reductions in these goals having direct consequences in also reducing progress in the other goals which they are closely linked to. “Data Fraud or Threat” has the capacity to inhibit innovation and Industrial Performance (SDG 9), reducing competitiveness (and having the potential to erode societal confidence in governance processes). “Water Crises” (linked with climate change) have a direct impact on Human Health and Well Being (SDG 3) as well as reducing access to Clean Water and Sanitation (SDG 6) and reducing agricultural production which increases Hunger (SDG 2). The causal loop diagram also highlights “Conflict” as a variable (driven by multiple environmental-socio-economic factors) which together with regions most impacted by climate degradation will lead to an increase in migrant refugees enhancing the spread of disease and global pandemic risk, thus impacting directly on Human Health and Well Being (SDG 3)

4.2. Existential and catastrophic risk

The level and consequences of these risks may be severe. Existential Risks (ER) have a wide scope, with extreme danger, and are “a risk that threatens the premature extinction of humanity or the permanent and drastic destruction of its potential for desirable future development” (Farquhar et al., 2017,) essentially being an event or scenario that is “transgenerational in scope and terminal in intensity” (Baum & Handoh, 2014). With a smaller scope, and lower level of severity, global catastrophic risk is defined as a scenario or event that results in at least 10 million fatalities, or $10 trillion in damages (Bostrom & Ćirković, 2008). Global Catastrophic Risk (GCR) events are those which are global, but they are durable in that humanity is able to recover from them (Bostrom & Ćirković, 2008; Cotton-Barratt, Farquhar, Halstead, Schubert, & Snyder-Beattie, 2016) but which still have a long-term impact (Turchin & Denkenberger, 2018b).

Achieving the Sustainable Development Goals can be considered to be a means of reducing the long-term global catastrophic and existential risks for humanity. Conversely if the targets represented across the SDGs remain unachieved there is the potential for these forms of risk to develop. This association combined with the likely emergence of new challenges over the next decades (Cook, Inayatullah, Burgman, Sutherland, & Wintle, 2014) means that it is of great value to identify points within the systems representations of the Sustainable Development Goals that could both lead to global catastrophic risk and existential risk, and conversely that could act as prevention, or leverage points in order to avoid such outcomes. This identification in turn enables sensible policy responses to be constructed (Sutherland & Woodroof, 2009).

Whilst existential threats are unlikely, there is extensive peril in global catastrophic risks. Despite being lesser in severity than existential risks, they increase the likelihood of human extinction (Turchin & Denkenberger, 2018a) through chain reactions (Turchin & Denkenberger, 2018a), and inhibiting humanity’s response to other risks (Farquhar et al., 2017). It is necessary to consider risks that may seem small, as when acting together, they can have extensive consequences (Tonn, 2009). Furthermore, the high adaptability potential of humans, and society, means that for humanity to become extinct, it is most likely that there would be a series of events that culminate in extinction as opposed to one large scale event (Tonn & MacGregor, 2009; Tonn, 2009).

Whilst the prospect of existential risk, or global catastrophic risk can seem distant, the Stern Review on the Economics of Climate Change estimated the risk of extinction for humanity as 0.1 % annually, which accumulates to provide the risk of extinction over the next century as 9.5 % (Cotton-Barratt et al., 2016). With respect to identifying these risks, it is known that in particular, “positive feedback loops… represent the gravest existential risks” (Kareiva & Carranza, 2018), with pollution also having the potential to pose an existential risk.

#### Piracy crushes trade and creates failed states– terrorist coordination cuts off key chokepoints

**Murphy 12** (a senior strategic analyst at the University of Reading, where he is writing a doctoral dissertation on maritime irregular warfare and related criminal activity at sea under the supervision of Professor Colin S. Gray. He holds degrees from the universities of Wales and Reading. He has published widely on maritime terrorism, piracy, and riverine warfare; an Adelphi Paper on modern piracy and maritime terrorism is forthcoming. U.S. Naval War College Digital Commons CIWAG Case Studies 8-2012 “Piracy” <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1003&context=ciwag-case-studies> Images (map) omitted. August 2012)DR 22

Somali piracy cannot be seen in isolation from the wider geostrategic importance of free movement and safe passage to trade between Europe and Asia and energy movements outbound from the Arabian Gulf to much of the world. This importance has been brought into sharper focus by the growing political turmoil in Yemen, which has drawn attention on the fact that both sides of the Gulf of Aden constitute a single geo-strategic entity. The eighteen-mile-wide Bab el-Mendeb is one of the world’s vital chokepoints. It is the gateway to the Suez Canal, and **its closure would** block off the sea route upon which this huge trade depends. Any realistic threat of complete **closure** would provoke a major political and military response. However, the same effect could be achieved using low-level attacks to persuade the international shipping industry that the transit **risks are too great** and maritime traffic would have to divert around Africa, adding ten to twelve days to a voyage. That threat would be one step nearer to realization if one shore of the Gulf were to fall into hostile hands, and it would increase substantially if both coasts were to fall under the sway of organizations with a common purpose. Britain occupied Aden in the 19th century to guard the vital sea route to India and took control of what is now Somaliland when France, its leading imperial rival, threatened to expand its influence beyond the borders of the French Coast of the Somalis, today’s Djibouti. It is worth at least noting that al Qaeda’s two forays into maritime terrorism were both launched from Yemen: the attack on the USS Cole in Aden harbor in 2000 and the attack on the MV Limburg off the oil port of Ash Shihr al Mukallah in 2002.

Yemen’s situation is not as desperate as Somalia’s. It is not a failed state but is nonetheless politically fragile and economically weak. The government is confronted by a rebellion by the Shi’ite Houthi faction in the north adjoining the Saudi Arabian border, a separatist movement in the south, and an al Qaeda faction, al Qaeda in the Arabian Peninsula (AQAP), which appears **ready** to exploit whatever breakdown occurs. The militant group **Al-Shabaab** has sworn to support AQAP and to exploit the **opportunity** **for** the conflicts on either side of the Gulf of Aden to become “increasingly intertwined,” according to their Somali spokesman Mukhtar Robow. Although the use of a reductionist lens to conflate two separate conflicts needs to be resisted, contact has occurred between AQAP and al-Shabaab and coordinated action cannot be ruled out in the future. If al-Shabaab controlled the southern shore of the Gulf of Aden, the interchange between the two groups would become easier.

#### Trade breakdown causes civil and proxy conflicts that draw in Iran, Russia, and North Korea---nuclear war.

Kampf ’20 [David; June 16; PhD Fellow at the Center for Strategic Studies at The Fletcher School, MA in International Affairs from Columbia University; World Politics Review, “How COVID-19 Could Increase the Risk of War,” https://www.worldpoliticsreview.com/articles/28843/how-covid-19-could-increase-the-risk-of-war]

But that overlooked the ways in which the risk of interstate war was already rising before COVID-19 began to spread. Civil wars were becoming more numerous, lasting longer and attracting more outside involvement, with dangerous consequences for stability in many regions of the world. And the global dynamics most commonly cited to explain the falling incidence of interstate war—democracy, economic prosperity, international cooperation and others—were being upended.

If the spread of democracy kept the peace, then its global decline is unnerving. If globalization and economic interdependence kept the peace, then a looming global depression and the rise of nationalism and protectionism are disconcerting. If regional and global institutions kept the peace, then their degradation is unsettling. If the balance of nuclear weapons kept the peace, then growing risks of proliferation are disquieting. And if America’s preeminent power kept the peace, then its relative decline is troubling.

Now, the pandemic, or more specifically the world’s reaction to it, is revealing the extent to which the factors holding major wars in check are withering. The idea that war between nations is a relic of the past no longer seems so convincing.

The Pessimists Strike Back

More than any other individual, it was cognitive scientist Steven Pinker who popularized the idea that we are living in the most peaceful moment in human history. Starting with his 2011 bestseller, “The Better Angels of Our Nature: Why Violence Has Declined,” Pinker argued that the frequency, duration and lethality of wars between great powers have all decreased. In his 2019 book, “Enlightenment Now: The Case for Reason, Science, Humanism, and Progress,” he wrote that war “between the uniformed armies of two nation-states appears to be obsolescent. There have been no more than three in any year since 1945, none in most years since 1989, and none since the American-led invasion of Iraq in 2003.”

Optimists like Pinker held that, rather than the world falling apart, as a quick glance at headline news might suggest, the opposite was true: Humanity was flourishing. More regions are characterized by peace; fewer mass killings are occurring; governance and the rule of law are improving; and people are richer, healthier, better educated and happier than ever before.

In their book, “Clear and Present Safety: The World Has Never Been Better and Why That Matters to Americans,” Michael A. Cohen and Micah Zenko argued that the evidence is so overwhelming that it is difficult to argue against the idea that wars between great powers, and all other interstate wars, are becoming vanishingly rare. Even when wars do break out, they tend to be shorter and less deadly than they were in the past. John Mueller, a senior fellow at the Cato Institute, also reasoned that the idea of war, like slavery and dueling before it, was in terminal decline, while Joshua Goldstein, an international relations researcher at American University, credited the United Nations and the rise of peacekeeping operations for helping win the “war on war.”

But in recent years, a range of critics have begun to poke holes in these arguments. Tanisha M. Fazal, an international relations professor at the University of Minnesota, contends that the decline in war is overstated. Major advances in medicine, speedier evacuations of wounded soldiers from the field of battle and better armor have made war less fatal—but not necessarily less frequent. Fazal and Paul Poast, who is at the University of Chicago, further assert that the notion of war between great powers as a thing of the past is based on the assumption that all such conflicts resemble World War I and II—both are historical anomalies—and overlooks the actual wars fought between great powers since 1945, from the Korean War and the Vietnam War to proxy wars from Afghanistan to Ukraine. Meanwhile, Bear F. Braumoeller, an Ohio State political science professor, analyzed the same historical data on conflicts used by Pinker, Mueller and Goldstein, and found no general downward trend in either the initiation or deadliness of warfare over the past two centuries. What’s more, Braumoeller contends that the so-called “long peace”—the 75 years that have passed without systemic war since World War II—is far from invulnerable, and that wars are just as likely to escalate now as they used to be. Just because a major interstate war hasn’t happened for a long time, doesn’t mean it never will again. In all probability, it will.

And by focusing solely on interstate wars, the optimists miss half the story, at least. Wars between states have declined, but civil wars never disappeared—and these internal conflicts could easily escalate into regional or global wars.

The number of conflicts in the world reached its highest point since World War II in 2016, with 53 state-based armed conflicts in 37 countries. All but two of these conflicts were considered civil wars. To make matters worse, new studies have shown that civil wars are becoming longer, deadlier and harder to conclusively end, and that these internal conflicts are not really internal. Civil wars harm the economies and stability of neighboring countries, since armed groups, refugees, illicit goods and diseases all spill over borders. Some 10 million refugees have fled to other countries since 2012. The countries that now host them are more likely to experience war, which means states with huge refugee populations like Lebanon, Jordan and Turkey face legitimate security challenges. Even after the threat of violence has diminished in refugees’ countries of origin, return migration can reignite conflicts, repeating the brutal cycle.

A Yugoslav Federal Army tank.

Perhaps most importantly, recent research indicates that civil wars increase the risk of interstate war, in large part because they are attracting more and more outside involvement. In a 2008 paper, researchers Kristian Skrede Gleditsch, Idean Salehyan and Kenneth Schultz explained that, in addition to the spillover effects, two other factors in civil wars increase international tensions and could possibly provoke wider interstate wars: external interventions in support of rebel groups and regime attacks on insurgents across international borders.

Immediately after the Cold War, none of the ongoing civil wars around the world were internationalized. According to the Uppsala Conflict Data Program, there were 12 full-fledged civil wars in 1991—in Afghanistan, Iraq, Peru, Sri Lanka, Sudan, and elsewhere—and foreign militaries were not active on the ground in any of them. Last year, by contrast, every single full-fledged civil war involved external military participants. This is due, in part, to the huge growth in U.S. military interventions abroad into civil conflicts, but it’s not only the Americans. All of today’s major wars are in essence proxy wars, pitting external rivals against one another. Conflicts in Syria, Yemen and Libya are best understood not as civil wars, but as international warzones, attracting meddlers including the United States, Russia, Saudi Arabia, Turkey, Iran, France and many others, which often intervene not to build peace, but to resolve conflicts in a way that is favorable to their own interests. These internationalized wars are more lethal, harder to resolve and possibly more likely to recur than civil wars that remain localized. It is not that difficult to imagine how these conflicts could spark wider international conflagrations. Wars, after all, can quickly spiral out of control.

As Risks Increase, Deterrents Decline

To make matters worse, most of the global trends that explained why interstate war had decreased in recent decades are now reversing. The theories that democracy, prosperity, cooperation and other factors kept the peace have been much debated—but if there was any truth to them, their reversals are likely to increase the chance of war, irrespective of how long the coronavirus pandemic lasts.

Democracy is often considered a prophylactic for war. Fully democratic countries are less likely to experience civil war and rarely, if ever, go to war with other democracies—though, of course, they do still go to war against non-democracies. While this would be great news if democracy and pluralism were spreading, there have now been 14 consecutive years of global democratic decline, and there have been signs of additional authoritarian power grabs in countries like Hungary and Serbia during the pandemic. If democracy backslides far enough, internal conflicts and foreign aggression will become more likely.

Other theories posit that economic bonds between countries have limited wars in recent decades. Dale Copeland, a professor of international relations at the University of Virginia, has argued that countries work to preserve ties when there are high expectations for future trade, but war becomes increasingly possible when trade is predicted to fall. If globalization brought peace, the recent wave of far-right nationalism and populism around the world may increase the chances of war, as tariffs and other trade barriers go up—mostly from the United States under President Donald Trump, who has launched trade wars with allies and adversaries alike.

The coronavirus pandemic immediately elicited further calls to reduce dependence on other countries, with Trump using the opportunity to pressure U.S. companies to reconfigure their supply chains away from China. For its part, China made sure that it had the homemade supplies it needed to fight the virus before exporting extras, while countries like France and Germany barred the export of face masks, even to friendly nations. And widening economic inequalities, a consequence of the pandemic, are not likely to enhance support for free trade.

This assault on open trade and globalization is just one aspect of a decaying liberal international order, which, its proponents argue, has largely helped to preserve peace between nations since World War II. But that old order is almost gone, and in all likelihood isn’t coming back. The U.N. Security Council appears increasingly fragmented and dysfunctional. Even before Trump, the world’s most powerful country ratified fewer treaties per year under the Obama administration than at any time since 1945.

Trump’s presidency only harms multilateral cooperation further. He has backed out of the Paris Agreement on climate change, reneged on the Iran nuclear deal, picked fights with allies, questioned the value of NATO and defunded the World Health Organization in the middle of a global health crisis. Hyper-nationalism, rather than international collaboration, was the default response to the coronavirus outbreak in the U.S. and many other countries around the world.

It’s hard to see the U.S. reluctance to lead as anything other than a sign of its inevitable, if slow, decline. The country’s institutionalized inequalities and systemic racism have been laid bare in recent months, and it no longer looks like a beacon for others to follow. The global balance of power is changing. China is both keen to assert a greater leadership role within traditionally Western-led institutions and to challenge the existing regional order in Asia. Between a rising China, revanchist Russia and new global actors, including non-state groups, we may be heading toward an increasingly multipolar or nonpolar world, which could prove destabilizing in its own right.

Finally, the pacifying effect of nuclear weapons could be waning. While vast nuclear arsenals once compelled the United States and the Soviet Union to reach arms control agreements, old treaties are expiring and new talks are breaking down. Mistrust is growing, and the chance of an unwanted U.S.-Russia nuclear confrontation is arguably as high as it has been since the Cuban missile crisis.

The theory of nuclear peace may no longer hold if more countries are tempted to obtain their own nuclear deterrent. Trump’s decision to abandon the Iran nuclear deal, for one thing, has only increased the chance that Tehran will acquire nuclear weapons. It’s almost easy to forget that, just a few short months ago, the United States and Iran were one miscalculation or dumb mistake away from waging all-out war. And despite Trump’s efforts to negotiate nuclear disarmament with Kim Jong Un’s regime in Pyongyang, it is wishful thinking to believe North Korea will give up its nuclear weapons. At this point, negotiators can only realistically try to ensure that North Korea’s nuclear menace doesn’t get even more potent.

In other words, by turning inward, the United States is choosing to leave other countries to fend for themselves. The end result may be a less stable world with more nuclear actors.

If leaders are smart, they will take seriously the warning signs exposed by this global emergency and work to reverse the drift toward war.

If only one of these theories for peace were worsening, concerns would be easier to dismiss. But together, they are unsettling. While the world is not yet on the brink of World War III and no two countries are destined for war, the odds of avoiding future conflicts don’t look good.

The pandemic is already degrading democracies, harming economies and curtailing international cooperation, and it also seems to be fostering internal instability within states. Rachel Brown, Heather Hurlburt and Alexandra Stark argue that the coronavirus could in fact sow more civil conflict. If this proves accurate, the increase in civil wars is likely to lead to more external meddling, and these next proxy wars could soon precipitate all-out international conflicts if outsiders aren’t careful. With the usual deterrents to conflict declining around the world, major wars could soon return.

### 4

#### CP: Private entities in China should appropriate outer space by creating asset tokens for satellites used for 5G and their geospatial positioning. Private entities in china should appropriate outer space by creating asset tokens for those orbital slots and their geospatial positioning. All asset tokens should be recorded on a blockchain system.

#### Asset tokenization spills over to broader blockchain in space—industry needs a first mover

* Private appropriation key—tokens require a claim to own satellites, public govt refuses to do blockchain, private companies in other nations are scared of taking the first risk on blockchain and losing big, lack of bizcon because no legal clarity on whether private entities can own tokens of space assets
* Successful token-based ownership of satellites would lead to tokenization of things like georbital positioning and spatial data—that would vastly improve Space Traffic Management

**Ravichandran and Scatteia 19** (Aravind Ravichandran Senior Associate, PwC Space Practice, independent consultant and market analyst in the space industry with a multidisciplinary background and over 8 years of international, cross-functional experience across sectors.  Luigi Scatteia, Partner in PwC Advisory France, a leading global professional services firm. Within PwC he leads the Space Practice, coordinating its activities worldwide in a cross line-of-service fashion. He has ~20 years of experience in the space sector along the wider value chain and 9 years in strategy consulting in the sector. Prior to PwC, Luigi has worked for: the university of Naples “Federico II” as a engineering teaching associate; the Italian Aerospace Research Centre in Capua, Italy, as a scientists and as a project and business development manager; for the European Space Agency European Astronaut Centre in Cologne, Germany. “Blockchain What are the Applications for the Space Industry?” <https://www.pwc.fr/fr/assets/files/pdf/2019/03/fr-pwc-space-and-blockchain-2019.pdf> Figures 1 and 2 could not be reproduced from the original source, but the text is copied and pasted February 2019)DR 22

Asset Tokenization is the process of converting some form of an asset into a digital token that can be moved, recorded or stored **on a blockchain system**, where the asset can be manipulated as a digital token. Tokenizing an asset would enable one to manage its value exchange based on the contract written into the blockchain network. Tokens issued through the Asset Tokenization process are a special type called “asset-backed tokens” or “security tokens”, which act as claims to the underlying assets.

These tokens might represent any asset, including a song, a kilowatt-hour of solar energy, a square metre of real estate or a square kilometre of an asteroid. As an example, tokenization allows one to **tokenize a** property, thus enabling one to purchase only two square metres of a fifty square metre house.

Figure 1 presents five potential use cases for the space industry: Space Financing, Space Asset Tokenisation, Space Industry Procurement, Manufacturing Supply Chain Management and Satellite Communication. For the purposes of relevance in space exploration and brevity, this whitepaper focuses on some potential applications of blockchain in the space industry particularly on the first two use cases regarding financing for the space industry and space asset tokenisation. The use cases discussed here are proposed by the team at PwC and should therefore not be assumed to be an exhaustive list of all applications of blockchain.

Figure 1: General Use Cases of Blockchain for the Space Industry

Space Financing

Alternative tokenbased financing for space missions through ICOs. Reduces the barriers to raising funding by democratising access to finance

**Space Asset Tokenisation** Enabling a crypto **token**-based ownership of space assets including spacecrafts, satellites and potentially, astronomical bodies such as asteroids.

Space Industry Procurement Enables a strong audit trail across the stakeholders. Efficient procurement processes with faster, automated payments through smart contracts

Manufacturing Supply Chain Management Enhance visibility, traceability and accountability of products throughout the manufacturing supply chain, thus improving the overall transparency.

Secure Satellite Communication. Using **satellites** as Blockchain nodes for data processing and in-space data storage, thereby leading to development of **space-based blockchain** applications.

Employing Initial Coin Offerings as a Means of Financing

How does an Initial Coin Offering work?

Essentially, an Initial Coin Offering (ICO) is a token generation and distribution event for buyers who are directly investing in the product or the service provided by the company, by means of individualised tokens generated by the company. Initially, the company publishes a whitepaper detailing its products and services along with how investors could benefit from buying its tokens, along with what type of currency would be accepted in the ICO.

Buyers who invest usually tend to benefit from access to the product or the service that is determined by the token, and also benefit by the appreciation of the token’s price.

In essence, this provides the company with a mechanism to incentivise the adoption of its products and services without giving up equity. This is one of the key aspects of an ICO and also one of the significant differences with an Initial Public Offering (IPO).

Buyers participating in an ICO tend to get what is called a “utility token”, which allows them to use the product or the service once it is launched. The financial incentive for the buyers is the hope for the demand for the product or the service will skyrocket once it is launched, leading to an increase in the price of the token, by means of which the investor profits. Until 2018, over $22 billion has been raised in total through ICOs, for a majority of companies in industries including financial services, blockchain platforms, and messaging services1.

Applying ICOs for the Space Industry

Although investments in the space industry are on the rise in the recent years, access to finance is still considered one of the biggest challenges for entrepreneurs. As such, blockchain technology, and in particular ICOs, might find itself as an attractive proposition to help tackle this challenge. Another aspect of space that might be an exciting prospect for ICOs is funding space exploration missions, especially in the age of “New Space”. Monetising data from outer space exploration missions, in particular from missions to asteroids, moon and Mars are particularly interesting from a commercial standpoint.

Funding Space Start-ups

Apart from debt funding and equity funding, encouraging ICOs as a means of funding could break barriers of entry in the space industry, which has been known to be capital intensive and highly risky. Traditional crowdfunding mechanisms, which are quite popular in the space industry, act mostly as donations to projects from enthusiasts, while ICOs could serve as an alternative funding mechanism for projects that have a utility for its customers.

A start-up that is involved in manufacturing a new propulsion for microsatellites need not have to wait on funding from a venture capitalist. Instead, it can conduct an ICO to provide tokens to its potential customers – for instance, a satellite integrator company – who could be potentially interested in trying out the new technology. This entity might make a strategic decision to invest in the propulsion start-up, which might help reduce its satellite manufacturing costs.

Additionally, the investing entity has an opportunity to reap its rewards for backing the start-up from an early stage by enjoying the benefits of token price appreciation. The entity also has the choice to sell its tokens back, if the startup is not successful in doing what it set out to do, according to the whitepaper. The “utility tokens” involved might even be part of a smart contract, which means that the start-up is encouraged to achieve its milestones, failing which it could lose its investing entities. National and regional space agencies such as CNES and ESA could serve as a platform to match entities such that there are strategic advantages for both the incumbents and the start-up.

They could be involved in creating an ICO-based funding ecosystem to enable interested entities to contribute to funding mechanisms for start-ups.

Monetising Space Exploration Missions

Moving away from the traditional approach to space exploration, in which only the **national space agencies** planned space missions, in the recent era of “NewSpace” a number of private space companies are planning missions to asteroids, the Moon and Mars. Sparked by the development of companies such as SpaceX and Planetary Resources, and the rise in private investments and space competitions such as XPrize, space exploration is increasingly becoming a competitive affair. At the time of writing (February 2019), SpaceIL, an Israeli organization, is expected to become the first privately funded lander on the surface of the Moon2 . A number of other companies, including PTScientists, Astrobotic, Moon Express and Team Indus, are in preparations for their private space missions to the Moon, while others such as SpaceX have a roadmap for Mars exploration. Although space exploration is about to become a more competitive affair, there is room for collaboration between the different parties including the space agencies. ICOs provide a way for such collaboration, keeping in mind the competition between the parties. With the sale of “utility tokens” in the ICO, a private company could provide access to valuable data for the interested entities, which also includes national space agencies, who are planning future missions to asteroids, the Moon and Mars. A lander on the Moon could generate new scientific data, which could then be monetised by using tokens, thanks to blockchain technology. Further, this approach enables a collaborative ecosystem of private companies, while also financially benefitting the parties in the process. A company like SpaceIL will generate useful scientific data that might be useful for other private companies and perhaps even national space agencies for planning future missions. ICOs provide a way for space agencies around the world to invest in private companies for getting exclusive access to data, if the mission proves successful. Even in the case where the lander mission fails, there is still useful data for the investing entities. ICOs offer the opportunity for private companies to benefit from their exploration activities. Similar to the first use case, blockchain technology allows for the entire token creation and investing process to be managed autonomously, thanks to smart contracts, which could enable a milestone-based investing approach, just as it is currently being done in various publicly funded commercial demonstration space programmes. Figure 2 summarises the two applications discussed here.

Figure 2: Use Cases for Initial Coin Offerings in the Space Industry Funding Space Start-ups An upcoming start-up in the space industry could use ICOs to generate “utility tokens” for its customers in the supply chain, who could potentially be interested in getting access to its products. The investing entity could also benefit from the appreciating token price of the start-up, based on the success of the product. ICOs also allow the investor to sell back the tokens, if the product is unsuccessful. Monetising Space Exploration Missions With the commercialisation of space resource utilization and missions to Moon and Mars, scientific data from these bodies might become critical for planning future space missions including asteroid mining and outposts on Moon and Mars. Private space companies could use “utility tokens” from ICOs to distribute access to data gathered on their missions and thus enabling the monetisation of their missions.

How does tokenizing an asset work?

Through the process of generating security tokens for digital assets, a physical asset such as a painting could be converted into digital shares of ownership. As such, multiple owners could own the asset and buy or sell digital shares taking advantage of rising or falling prices. This enables a variety of benefits, including liquidity for asset owners, low transaction costs, increased transparency and a digital, 24/7 market.

The most crucial application of asset tokenization is the fact that there are no territorial barriers to investing in assets, and hence any potential interested entity from anywhere in the world can invest into an asset without complicated procedures, with high security models and the speed of transfer offered by the blockchain network, due to the absence of middlemen.

As discussed, any asset can be tokenized into the blockchain network, including venture capital funds, metals, real estate, commodities and art forms (paintings, songs or movies). As shown in Figure 3, this opens up a variety of applications for the space industry, namely 1) in the case of tokenizing astronomical assets, which is a fundamental use case for the commercial space resource utilisation industry and 2) for tokenizing geospatial information and insights in order to store it on the blockchain network.

Tokenizing Space Resources

Potential space resource utilisation approaches including asteroid mining and regolith extraction on the Moon could be facilitated by the tokenization of assets. Tokenizing space resources has a huge range of applications in the space mining industry, since blockchain provides a mechanism to register the physical location of space resources as digital tokens, and track their transactions, thus enabling for a transparent identification and management process. ConsenSys, a blockchain firm, recently acquired Planetary Resources, an asteroid mining company, in order potentially to initiate the application of this use case3 . It is possible that, in a few years, ConsenSys could manage the transactions of Planetary Resources using its Ethereum-based blockchain network, thus enabling a new wave of investment for space resource utilization by an entity, irrespective of its geographical location.

Tokenizing Geospatial Data

Geospatial data gathered **using satellites** could be tokenized into “utility tokens”, thus enabling a digital storage mechanism on the blockchain network. Land transactions and land data repositories are two powerful applications of tokenized geospatial data. Blockchain-based land registry systems provide an innovative way to eliminate the bureaucratic paperwork involved in registration and verification of land transactions, by eliminating the need for an intermediary and reducing transaction-processing time. Countries such as India, the Netherlands and Sweden are already testing out pilot projects to identify how using tokenized geospatial data would enhance their repository maintenance4. Further, crypto-spatial protocols could be developed that could serve as “location tokens.” In an Internet of Things enabled world, a traveller using a public transport might be recognized using the geolocation token data available extracted from satellite data, which in turn, could be used to calculate the travel fares and automatically deducted from the crypto wallet5 . Tokenizing geospatial data might have a number of such far-reaching advantages across industries.

Recent Trends

Although there are plenty of applications of blockchain technologies across the space value chain, adoption rates have rather been low. With respect to adoption by the public bodies, **space agencies have been sceptical about the potential of blockchain** and are pursuing a “wait-andwatch” approach as the industry aims to apply blockchain to their products and services. The European Space Agency conducted a study in 2018 to identify its applications in Procurement, Voting and Information Management6.

Spacebit Capital was launched in 2018 as the first crypto fund for the space sector, in collaboration with the Moon Village Association and angel investors from Luxembourg and European Space Angels7 . Private companies have rather been more ambitious in trying to apply blockchain technologies to the space industry. SpaceChain is currently focused on developing a satellite-based blockchain network to create an open source operating system to develop blockchain applications. Recently, the company completed its first blockchain transaction in space enabling energy savings while taking advantage of the recent trends in low-earth orbit based satellite constellation8.

Challenges in Adoption

Regulatory challenges, uncertainty with legal frameworks along with the prevalence of scams in bitcoin and ICO has **slowed down** the adoption rates for **blockchain** technology9 . There is a country dependent regulatory framework for ICOs and as such, it is one of the biggest hurdles. With respect to tokenization, lack of clarity of legal rights of a token holder **discourages companies** from tokenizing their assets. However, although adoption has been slow, the potential of blockchain technology is increasingly being investigated in the space sector, particularly in the areas of supply chain management. ICOs and asset tokenization presents some interesting challenges and opportunities for the space industry particularly with respect to its feasibilities and capabilities. Thus, the private industry and the space agencies need to conduct feasibility studies to identify areas where blockchain adoption could help enhance the space ecosystem.

#### Space blockchain can scale but hesitation now

**Taylor 22** (Dylan, Chairman & CEO, Voyager Space Holdings. “Blockchain's Applications For The Space Industry” <https://www.forbes.com/sites/forbesbusinesscouncil/2022/02/10/blockchains-applications-for-the-space-industry/?sh=169c392d721f> February 10, 2022)DR 22

Life has a way of teaching us that patience pays off. The key for space start-ups is staying viable while they await their breakthrough. Regulatory challenges necessitate patience and uncertainty when a company begins its quest to go to space.

Most countries now have a regulatory structure that governs ICOs, and when it comes to tokenization, discerning legal rights represents a significant challenge for sellers and buyers. Nonetheless, private companies and space agencies need to conduct their own feasibility and engineering studies to spot areas where adopting blockchain solutions pays off.

The PWC report shows that **adoption rates remain low** as some companies **have** **opted** for a wait-and-see approach, not wanting to be the guinea pig that sinks time and resources into something that may or may not pay off.

What if using blockchain in space is not a solution that moves heaven and Earth, but rather a tool to increase transparency and efficiency in our processes? Consider this: Manufacturing and supply chain management could enhance traceability and accountability of productions throughout the chain. It would improve transparency for customers. Using **sat**ellite**s** as nodes for data processing or storage could also **lead** to the creation of space-based blockchain applications.

#### Space enables Blockchain to scale- avoids Internet regulation

* Avoids internet dependencies—can communicate directly with private satellites instead—bypasses suffocating regulation by governments AND avoids cyber-vulnerabilities that hurt blockchain now AND expands blockchain to people lacking Internet access now—all of which are key to scaling blockchain globally

**Huang 20** (Roger, Toronto-based Forbes Contributor specialised in Blockchain technology and cryptocurrencies. “Cryptocurrency Is Strengthened By Space Exploration” <https://www.forbes.com/sites/rogerhuang/2020/06/29/cryptocurrency-is-strengthened-by-space-exploration/?sh=6d0010b93c5b> June 29, 2020)DR 22

Start with [Blockstream’s satellite API](https://blockstream.com/satellite/) for bitcoin. This 24/7 broadcast of the latest state of the bitcoin blockchain from space serves a number of purposes, providing another layer of communication as a backup. With six satellites up currently, coverage spans most of the world.

Bitcoin’s **peer-to-peer network** is distributed and resilient, but it still suffers from dependencies. There is a need for nodes to connect to the Internet in order **to communicate** with one another to reach consensus. While **an attack** isolating one node from this consensus state ([known as an Eclipse attack](https://bitcoinmagazine.com/articles/researchers-explore-eclipse-attacks-ethereum-blockchain)) would be theoretically very expensive, it would be less than an attack on the entire chain, and could be used to create double-spend situations **among** a limited number of nodes. Ensuring a backup broadcast might **mitigate** individual-level attacks.

**Ensuring a backup** for the network as a whole might also strengthen the blockchain. Governments have shown themselves capable of **censoring** the entire Internet because of content it didn’t like. By taking off the **dependency** on the Internet by just a little bit, satellite beaming may help **save** bitcoin from a future coordinated **state attack** — and will help ensure 24/7 uptime for all peers even if a nation-state decides to totally take down the Internet within its geographical jurisdiction.

It may also, if costs of satellite launch decrease and communication improvements increase between space-orbiting objects, eventually serve as **a way to** get people who currently don’t have access to the Internet, **access** to the data needed to onboard them onto bitcoin. In 2016, the World Economic Forum [noted that 4 billion people didn’t have Internet connection](https://www.weforum.org/agenda/2016/05/4-billion-people-still-don-t-have-internet-access-here-s-how-to-connect-them/) — the majority of the world. In order for bitcoin and cryptocurrencies to truly expand their reach exponentially, either people will have to have more complete internet coverage or there will need to be alternative ways to **broadcast** the consensus **data** blockchains are dependent on.

#### Global adoption solves warming

* Blockchain raises funding for innovative tech
* Better grid distribution and generation of energy- more efficient use of data
* Raises funds to disseminate clean energy—states prefer things like electricity subsidies and coal, but Blockchain raises decentralized funds
* Renewable energy lacks funding now—blockchain overcomes because peer-to-peer is perfectly secured and trustworthy
* Saves vulnerable wildlife—money goes towards their protection

**Kawabata 22** (Toyo, Associate Expert, UN Environmental Programme, Masters in International Public Management from Sciences Po, a leading French University. “In battle against climate crisis, don't overlook the blockchain” [https://www.unep.org/news-and-stories/story/battle-against-climate-crisis-dont-overlook-blockchain January 2](https://www.unep.org/news-and-stories/story/battle-against-climate-crisis-dont-overlook-blockchain%20January%2022)5, 2022)DR 22

As the world increasingly looks at using digital technology to accelerate action on issues such as climate change and biodiversity loss, blockchain is pushing to the forefront.

Blockchain is a digitally distributed, decentralized ledger that helps to verify and trace multistep transactions. While it might be best known as the architecture behind crypto-currencies like Bitcoin, it is finding uses in everything from tracking the sustainability of products to the real-time monitoring of pollution.

This technology is key to innovations in **energy** and climate, say experts, but so far, little attention has been given to how blockchain can be used in developing countries. **A new report** from the United Nations Environment Programme (UNEP) and the Social Alpha Foundation (SAF) is looking to change this picture and unlock new opportunities.

[Blockchain for Sustainable Energy and Climate in the Global South: Use Cases and Opportunities](http://www.socialalphafoundation.org/wp-content/uploads/2022/01/saf-blockchain-report-final-2022.pdf) explores how the **technology** can **accelerate** the transition to clean energy and help combat climate change in developing countries. It’s a publication that comes as global temperatures are on pace to rise by [at least 2.7°C](https://www.unep.org/resources/emissions-gap-report-2021) by the end of the century, a number UN Secretary-General António Guterres [has called catastrophic](https://news.un.org/en/story/2021/10/1104012).

“**The world needs to** almost halve emissions over the next eight years to stay on track for a 1.5°C world, **while** at the same time **expanding** access to energy to bring hundreds of millions of people onto the grid,” said Mark Radka, Chief of UNEP’s Energy and Climate Branch, referring to data from UNEP’s [Emissions Gap Report 2021](https://c/Users/LENOVO/OneDrive/Desktop/UNEP%20DOCS/Stories/Emissions%20Gap%20Report%202021:%20The%20Heat%20is%20On). “Blockchain technology can play a part by making possible more accurate load monitoring, generation and distribution **in the grid** through **efficient use of data**,” he added.

Driving innovation

Several businesses, such as Power Ledger, an Australian technology company, have begun to tap into the potential of blockchain. The company established a pilot project in the Indian state of Uttar Pradesh that allowed homeowners with solar arrays on their rooftops to sell power to others on the grid, setting prices in real time and executing transactions over blockchain.

Systems like those can help accelerate the deployment of renewable energy in developing countries and help states move away from unsustainable electricity subsidies.

The United Nations Development Programme estimates that up to [$650 billion](http://www.socialalphafoundation.org/wp-content/uploads/2022/01/saf-blockchain-report-final-2022.pdf) per year in renewable energy financing will be needed to meet [Sustainable Development Goal 7](https://sdgs.un.org/goals/goal7) on energy. However, renewable energy projects can often be bogged down by financing shortfalls, high investment costs, and a lack of liquidity. These problems conspire to create a shortage of bankable projects. According to the UNEP/SAF report, blockchain

’s distributed ledger technology can provide improvements by enabling **renewable energy** project developers, investors, and purchasers to collaborate on a common platform with established international standards for due diligence and compliance.

For example, South Africa’s Sun Exchange allows anyone with an internet connection to buy solar panels online and rent them to businesses, hospitals, schools and other organizations in Africa. Sun Exchange uses the Bitcoin blockchain for cross-border payments so that there are no intermediaries between the beneficiaries and the investors.

In 2015, the company installed its first solar power panels at a school in the Cape Town region, financed entirely by private individuals through cryptocurrencies. By 2020, the platform had 18,000 users in 162 countries.

Through the Sun Exchange’s solar installations, organizations have reduced their energy costs by 20-30 per cent and have been able to redirect these funds towards their core offerings, including quality education for children, positive living environments for elderly residents and care for vulnerable wildlife.

#### Warming guarantees extinction and o/w

Krosofsky 21 [Andrew, freelance writer for over two decades] “How Global Warming May Eventually Lead to Global Extinction.” Green Matters. March 11, 2021. <https://www.greenmatters.com/p/will-global-warming-cause-extinction> TG

Will global warming cause extinction?

Eventually, yes. Global warming will invariably result in the mass extinction of millions of different species, humankind included. In fact, the Center for Biological Diversity says that global warming is currently the greatest threat to life on this planet. Global warming causes a number of detrimental effects on the environment that many species won’t be able to handle long-term.

Extreme weather patterns are shifting climates across the globe, eliminating habitats and altering the landscape. As a result, food and fresh water sources are being drastically reduced. Then, of course, there are the rising global temperatures themselves, which many species are physically unable to contend with.

Formerly frozen [arctic and antarctic regions are melting](https://www.greenmatters.com/p/arctic-ice-melting), increasing [sea levels](https://www.greenmatters.com/news/2019/01/15/bPhgWvMpZ/oceans-warming-climate-change) and temperatures. Eventually, these effects will create a perfect storm of extinction conditions.

What species will go extinct if global warming continues?

The melting glaciers of the arctic and the searing, unmanageable heat indexes being seen along the Equator are just the tip of the iceberg, so to speak. The species that live in these [climate zones](https://www.greenmatters.com/p/what-is-a-climate-zone) have already been affected by the changes caused by global warming. Take polar bears for example, whose habitats and food sources have been so greatly diminished that they have been forced to range further and further south.

Increased carbon dioxide levels in the atmosphere and oceans have already led to [ocean acidification](https://www.greenmatters.com/p/what-causes-ocean-acidification#:~:text=According%20to%20the%20Natural%20History,for%20some%20species%20to%20survive.). This has caused many species of crustaceans to either adapt or perish and has led to the mass bleaching of more than 50 percent of Australia’s [Great Barrier Reef](https://www.greenmatters.com/p/coral-great-barrier-reef), according to [National Geographic](https://www.nationalgeographic.com/magazine/article/explore-atlas-great-barrier-reef-coral-bleaching-map-climate-change).

According to the Center for Biological Diversity, the current trajectory of global warming predicts that more than 30 percent of Earth’s plant and animal species will face extinction by 2050. By the end of the century, that number could be as high as 70 percent.

### Case

#### Not private - China is a huge alt cause

Chaturvedi 1/29 (Amit Chaturvedi, [Hindustan Times, New Delhi, ], 1-29-2022, “China plans 'megaconstellation' of 13,000 satellites, claims report“, Hindustan Times, accessed: 1-30-2022, https://www.hindustantimes.com/world-news/china-plans-megaconstellation-of-13-000-satellites-claims-report-101643421318766.html) ajs

China is embarking on a mission that has renewed concerns about spying. It plans to send upto 13,000 satellites in space - a ‘megaconstellation’ - that will encircle the Earth in the lower orbit, a report in the Daily Mail said.

The company that has got the responsibility of this work has said that the main goal of the mission is to establish supremacy in lower Earth orbit, the report further said.

Strengthening of 5G network is the aim: China

China's State Administration of Science, Technology and Industry for National Defense (SASTIND) has called for orderly development of small satellites, according to the Daily Mail report.

It said that the group of satellites will be able to provide surveillance over much of the Earth and strengthen internet facilities.

#### Our impact outweighs on timeframe --- too many development hurdles for their scenarios

Brooks et al 15 -- Panasonic Professor of Robotics (Emeritus), Computer Science and Artificial Intelligence Lab, Massachusetts Institute of Technology; Founder, Chairman, and Chief Technology Officer, Rethink Robotics; Abhinav Gupta -- Assistant Research Professor, Robotics Institute, Carnegie Mellon University; Andrew McAfee -- Principal Research Scientist and Cofounder, Initiative on the Digital Economy, Sloan School of Management, Massachusetts Institute of Technology (Rodney, 2/27/2015, "Artificial Intelligence and the Future of Humans and Robots in the Economy," Malcolm and Carolyn Wiener Annual Lecture on Science and Technology: Artificial Intelligence and the Rise of Robots, http://www.cfr.org/technology-and-science/artificial-intelligence-future-humans-robots-economy/p36205)

BROOKS: People always want us to fight, but we don't really. I think, although I agree with the general themes that Andy talks about, I think it's very easy for people who are not deep in the technology itself to make generalizations, which may be a little dangerous. And we've certainly seen that recently with Elon Musk, Bill Gates, Stephen Hawking, all saying AI is just taking off and it's going to take over the world very quickly. And the thing that they share is none of them work in this technological field. So let me explain why—and they're all smart people, but I think they're making a fundamental error and it gets to NEIL, actually. THOMPSON: After taking down Bill Gates, Elon Musk and Stephen Hawking, he's going to take down the Dalai Lama. Please continue, Rodney. BROOKS: So let's go back to an example from the '90s, when IBM's Deep Blue beat Kasparov, beat the world chess champion. And Kasparov got up and said, well, at least it didn't enjoy beating me. That was his—holding on to his humanity. And now, today, you can get programs that run on—and that was on a supercomputer and now you can get programs that run on laptops. There's about twelve of them that have a better chess rating than any human being has ever had. So people see that -- MCAFEE: It's so bad now—let me underscore what Rod is saying. It's so bad now that they asked human grand master a couple years ago how he would prepare for a match against a computer and he said, I'd bring a hammer. BROOKS: So they can play chess really, really well. And I think people generalize that in the way that if a person can do some task really, really well, they can do adjacent tasks quite well. But none of those chess programs can play tic-tac-toe. Imagine a chess grand master who couldn't play tic-tac-toe. It doesn't make sense. None of those chess programs can give advice to an aspiring human on how to play better. All they can be is a sparring partner. MCAFEE: That program couldn't play tic-tac-toe without being substantially redirected, right? BROOKS: Right. So people, I think, are seeing some of the image labeling that's going on, for instance. Google came out with image labeling, which is a great commercial problem for them. They want to be able to label images. And one of the examples was, that Jeff Hinton shows, one of the chief scientists, is, it's a picture and it says there's a baby holding a teddy bear or doll in there. You look at it, it's a baby holding a teddy—a doll. But then if you ask the program, where is the baby? All it can say is, well, this pixel has 10 percent probability of being a baby, this pixel has 80 percent. And people have done experiments. You have a mashup of, you know, a grotesque mashup of baby parts and it says it's a baby. It's a baby. It's got all the parts. But a person says, no, that's a grotesque mashup of baby parts in the image. THOMPSON: But Abhinav, you've solved this, right? GUPTA: No, no, no. BROOKS: Well, he's working towards-- GUPTA: So, can I-- BROOKS: He's working towards it because it's such a hard problem. GUPTA: Yeah, OK. Thank you. So since we are talking about images, I think I should chime in a little bit and tell you that—so what Andrew is talking about, that we have made big advances, again, they're very, very specific tasks. Given an image, tell me what label can you put on that image? We have gotten really good at this task. Some people claim even better than humans. I don't buy that, but let's assume that even better than humans. But that doesn't mean we can do anything else apart from that exact task. And that's what Rodney was talking about. They have no idea that—what does baby mean? What does having a baby mean in those images? No idea. You, as a human, would know, OK, if I'm saying there's a baby, it has a lot of meaning inside. You get a lot of meaning out of that thing. So while we have made significant advances in the last two years, I want to boil it down a little bit and say we still are a long, long way to go but Elon Musk or Bill Gates, everyone is talking about, we still have a long way to go. But there's hope, and that's what I think we have to see here. Two years ago, if you asked me can computers take an image and solve this problem, I would say I have invested seven years of my life but if you give me a random image, it will not work. And now, given a random image, it will work. So all it -- MCAFEE: This was the guy who was doing this for a living and if you asked him two years ago would this happen, he would say, no. This progress is weirdly fast and is surprising insiders in the field. GUPTA: Yeah. I agree. And I'm an insider in the field and I'm very surprised, I have to say. Now, at this point of time, I am like living in an awe of myself, in some sense, that—but it was like Rodney told—Rodney told us that in thirty-five years he never thought he'd do this all. I also thought some of it, like that, for thirty-five years, I will not solve—see this kind of classification performance. But as I'm saying this, still a long, long way to go and much harder way to go. What—where all the kind of gains have come from is the data. And I think—so technology, this like deep-learning technology has been there from '70s and '80s. Don't misunderstand that this technology came two years ago and everything's changed. This has been there for thirty years. It's just that for the first time in our technological advances we have data for this deep-learning technology to learn. MCAFEE: Let me jump on this because I think the three of us are really agreeing, instead of disagreeing. I chose my adjective pretty carefully. I said these advances are going to be economically significant. I completely agree with Rod that they're not going to be existentially significant on any timeframe that we really need to worry about, for exactly the reasons that you're bringing up. One way to think about this, the way I try to get my mind around it, is there are, from what I've been able to take in, there are something like between ten and twenty really fundamental challenges that these guys and their discipline have been working on. Common sense is a really great example of that. As I've looked around, these breakthroughs that we're seeing seem to be—kind of indicate that we're making real progress on one of those challenges, the challenges of learning in a pretty unstructured environment. That's a big deal. There are lots of other fundamental challenges in the discipline where the progress has not been as fast, and these are the ones that you're working on.

#### No retaliation – lack of attribution, it’ll be small-scale, and it’s only to justify already-made decisions.

Lewis ’16 (James; 2/17/2016; senior vice president at the Center for Strategic and International Studies, worked at the Departments of State and Commerce as a Foreign Service officer and as a member of the Senior Executive Service, rapporteur for the UN Group of Government Experts on Information Security; “Benefits Are Great, and the Risks Exist Anyway,” <https://www.nytimes.com/roomfordebate/2012/06/04/do-cyberattacks-on-iran-make-us-vulnerable-12/benefits-are-great-and-the-risks-exist-anyway>; Date Accessed: 8/15/2017; DS)

Do U.S. cyberattacks on Iran protect us or endanger us? We could better ask if having a downed pilot paraded through the streets of Tehran is preferable to cyberattack, or whether it is better to risk the losses that would accompany the **series of attacks** needed to destroy well-defended nuclear facilities. With Stuxnet, there are no television shots of burning buildings, weeping victims or tortured pilots. The politics of cyberattack as an alternative are **compelling**, although the attacks themselves **lack the destructiveness** of their kinetic brethren. The risks of Iran retaliating are **not increase**

**d**. The regime already blamed Stuxnet on the United States and Israel. In any case, we have been in sporadic covert conflict with Iran for decades, beginning with the hostages and embassy bombings, Iranian attacks in Iraq, and recent plots -- using proxies to provide a tissue of deniability -- against United States diplomats. Nor do cyberattacks against Iran **increase the risk of damaging cyberattacks** against the United States. It is true that we are defenseless; efforts to make us safer are hamstrung by self-interest, ideology and the gridlock of American politics. But we are no more vulnerable today than we were the day before the news. If someone decides to attack us, they may cite Iran as precedent, but it will only be to **justify a decision they had already made**.