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#### Confidence is high – most recent FDI index investment attractiveness

Kearney '4/7 [Kearney; 4-7-2022; "Kearney's 2022 FDI Confidence Index® reveals initial business leader optimism about the investment outlook. Subsequent geopolitical shocks are now remaking the worl"; No Publication; https://www.prnewswire.com/news-releases/kearneys-2022-fdi-confidence-index-reveals-initial-business-leader-optimism-about-the-investment-outlook-subsequent-geopolitical-shocks-are-now-remaking-the-worldand-their-hopes-for-a-robust-recovery-301519416.html]

The United States retains the top position for investment attractiveness for the 10th consecutive year.

Our results reflect the continued strength of developed markets in periods of crisis, be it a pandemic or geopolitical crisis.

Investors cited a rise in commodity prices, increasing geopolitical tensions, and persistent inflation as developments that were likely to occur in the year ahead—and each of these areas has been exacerbated by Russia's military actions in Ukraine.

WASHINGTON, April 7, 2022 /PRNewswire/ -- Kearney's Global Business Policy Council today released its 2022 Foreign Direct Investment Confidence Index (FDICI), an indicator of future FDI flows. The ranking reveals rebounding investor optimism about the global economy when the survey was in the field in January. However, their sanguine views on the economy, plans to increase FDI, rising FDI country scores, and a belief that most countries in the Index would see their three-year economic prospects improve indicate that the conflict in Ukraine must have caught investors by surprise, as it did much of the world.

The 2022 FDI Confidence Index

The 2022 FDI Confidence Index

"Entering year three of the pandemic, investors seemed much more hopeful about the global economy and FDI flows than they did just a year ago," says Paul A. Laudicina, founder of the FDI Confidence Index® and Kearney's Global Business Policy Council. "They did, however, have concerns that a rise in commodity prices, escalating geopolitical tensions, and persistent inflation were likely in the year ahead. Just a few months into the year, these concerns have come to fruition and been exacerbated by the Russian military actions in Ukraine."

The results of this year's FDI Confidence Index® illustrate both areas of business leader foresight as well as the blind spots regarding the changes that were on the immediate horizon. While the results cannot show directly how investor sentiment has shifted since the conflict began, several findings suggest we are likely to see a continued shift in FDI to developed markets, capitalizing on destinations marked by regulatory transparency and stability. In fact, investors cite transparency of government regulations and lack of corruption as the most important overall factors when choosing where to make FDI.

It is no surprise, then, that the United States takes the top ranking on the Index for the 10th consecutive year. Germany and Canada take the second and third rankings, respectively. In fact, developed markets account for 21 of 25 spots on the Index, including the top nine. These markets continue to show their strength in the survey during periods of crisis, representing more safety to business leaders whose strategies and bottom lines have been shaken by the pandemic.

"The United States retains the top position on Kearney's 2022 FDI Confidence Index® for the 10th consecutive year," Laudicina notes. "Our findings suggest we are likely to see a continued shift in FDI to developed markets, with the US chief among them. Investors seek to capitalize on destinations marked by regulatory transparency and stability on the one hand and technological innovation on the other. Robust US economic performance and bi-partisan action on the US infrastructure initiative also obviously have helped restore confidence in the country's longer term investment attractiveness, even as global geopolitical challenges persist."

Only four emerging markets are on this year's Index: China, the United Arab Emirates, Brazil, and—for the first time in the history of the Index—Qatar. China moves up two positions from 12th place last year to 10th, perhaps a reflection of the country's strong economic recovery in 2021 and continued solid growth projections over the next three years.

This year's report also includes a thematic section that reflects on how investors view their companies' environmental, social, and governance (ESG) commitments as well as those of their foreign investments. "Investors are clearly enthusiastic about pursuing ESG commitments," said Erik Peterson, managing director of the Global Business Policy Council and co-author of the study. Indeed, a striking 94 percent of investors agreed that their respective companies had developed a strategy to achieve their ESG commitments, 89 percent view their company's ESG commitments as a source of competitive advantage, and 73 percent said their ESG commitments had become stronger over the past three years. They also point to the role that ESG can play in improving supply chain issues and boosting productivity as among the most important factors driving their company's commitment to ESG. However, Peterson added, "Investors are still frequently split on which ESG goals to prioritize and how to measure them."

"The title of our 2022 FDI Confidence Index®, Optimism dashed, should be qualified: For how long? While global developments have certainly transformed the world, this does not preclude investors from building on existing momentum or pursuing new opportunities that arise," Laudicina said. "Focusing on investing in key sectors such as infrastructure and implementing ESG strategies sooner rather than later at home and abroad will provide a solid path forward for investors and companies, and ultimately help to build a stronger, more enduring investment environment consistent with fundamental changes evolving in global business conditions."

About The 2022 Kearney FDI Confidence Index®

The Kearney Foreign Direct Investment Confidence Index (FDICI) is an annual survey of global business executives that ranks markets that are likely to attract the most investment in the next three years. In contrast to backward-looking data sources on FDI flows, the FDICI provides unique forward-looking analysis of the markets that investors intend to target for FDI in the coming years. Since the FDICI's inception in 1998, the countries ranked on the Index have tracked closely with the top destinations for actual FDI flows in subsequent years.

The 2022 FDICI is constructed using primary data from a proprietary survey of senior executives of the world's leading corporations. The survey was conducted in January 2022. Respondents include C-level executives and regional and business leaders. All participating companies have annual revenues of $500 million or more. The companies are headquartered in 30 countries and span all sectors. The selection of these countries was based on UNCTAD data, with the 25 countries represented in the Index originating more than 95 percent of the global flow of FDI in recent years. Service-sector firms account for about 41 percent of respondents, industrial firms for 38 percent, and IT firms for 21 percent.

The Index is calculated as a weighted average of the number of high, medium, and low responses to questions on the likelihood of making a direct investment in a market over the next three years. Index values are based on responses only from companies headquartered in foreign markets. For example, the Index value for the United States was calculated without responses from US-headquartered investors. Higher Index values indicate more attractive investment targets.

All economic growth figures presented in the report are the latest estimates and forecasts available from Oxford Economics unless otherwise noted. Other secondary sources include investment promotion agencies, central banks, ministries of finance and trade, relevant news media, and other major data sources.

#### **Predictable legal structure key to business confidence.**

UN 21 [May 2021, UN Office of Outer Space Affairs, “Space Sustainability: Stakeholder Engagement Study” No Publication, https://www.unoosa.org/documents/pdf/studies/Space-Sustainability-Stakeholder-Engagment-Study-Outcome-Report.pdf]/ISEE

When asked about incentives, most respondents, including those from the commercial space sector, shared the view that a fair and **predictable** legal structure is crucial to providing a clear and balanced economic competition. By extension, the concept of forum shopping came up in a section of interviews, with the need to avoid a ‘race to the bottom’ in terms of the policy response to space sustainability challenges. What can also be asserted from the interviews in terms of private sector incentivization regarding space sustainability practices, there is a lack of deep research on the issue. Conceptual works, including bringing ideas from other sectors, i.e. behavioural economics, sociology, etc. and so on were identified by many as a large gap in the public policymaking process. Many called for more comparative studies to explore how things have shaped up in other domains and what lessons they have that we could extrapolate to the space domain. As it was previously touched upon in Question Three, time and again interviewees underlined the need for national legislation with a common global baseline. When it comes to the possible relations between the State and space companies, two main ideas came to the forefront of the answers received. On the one hand, it was articulated by a private operator that space companies might be able to regulate themselves in the short-term to carry out sustainable practices, which might also increase their reputation. On the other hand, a space policy professional advised that we cannot, and should not separate, the private sector from the State because sustainability is not possible without buy-in and action from both private **and** public operators. Even though it is the companies that are in an ideal position to understand the problem and come up with a solution, still, an all-encompassing and consistent solution is needed through public policy. At the same time, it was emphasized that the State, as well as the international space community, have to involve the industry in the discussions.

#### Business confidence is tied to economic growth

Sarah Chaney Cambon 21, Reporter on The Wall Street Journal's Economics Team, BA in Business Journalism from the University of North Carolina-Chapel Hill, “Capital-Spending Surge Further Lifts Economic Recovery”, Wall Street Journal, 6/27/2021, https://www.wsj.com/articles/capital-spending-surge-further-lifts-economic-recovery-11624798800

Business investment is emerging as a powerful source of U.S. economic growth that will likely help sustain the recovery.

Companies are ramping up orders for computers, machinery and software as they grow more confident in the outlook.

Nonresidential fixed investment, a proxy for business spending, rose at a seasonally adjusted annual rate of 11.7% in the first quarter, led by growth in software and tech-equipment spending, according to the Commerce Department. Business investment also logged double-digit gains in the third and fourth quarters last year after falling during pandemic-related shutdowns. It is now higher than its pre-pandemic peak.

Orders for nondefense capital goods excluding aircraft, another measure for business investment, are near the highest levels for records tracing back to the 1990s, separate Commerce Department figures show.

“Business investment has really been an important engine powering the U.S. economic recovery,” said Robert Rosener, senior U.S. economist at Morgan Stanley. “In our outlook for the economy, it’s certainly one of the bright spots.”

Consumer spending, which accounts for about two-thirds of economic output, is driving the early stages of the recovery. Americans, flush with savings and government stimulus checks, are spending more on goods and services, which they shunned for much of the pandemic.

Robust capital investment will be key to ensuring that the recovery maintains strength after the spending boost from fiscal stimulus and business reopenings eventually fades, according to some economists.

Rising business investment helps fuel economic output. It also lifts worker productivity, or output per hour. That metric grew at a sluggish pace throughout the last economic expansion but is now showing signs of resurgence.

The recovery in business investment is shaping up to be much stronger than in the years following the 2007-09 recession. “The events especially in late ’08, early ’09 put a lot of businesses really close to the edge,” said Phil Suttle, founder of Suttle Economics. “I think a lot of them said, ‘We’ve just got to be really cautious for a long while.’”

Businesses appear to be less risk-averse now, he said.

After the financial crisis, businesses grew by adding workers, rather than investing in capital. Hiring was more attractive than capital spending because labor was abundant and relatively cheap. Now the supply of workers is tight. Companies are raising pay to lure employees. As a result, many firms have more incentive to grow by investing in capital.

Economists at Morgan Stanley predict that U.S. capital spending will rise to 116% of prerecession levels after three years. By comparison, investment took 10 years to reach those levels once the 2007-09 recession hit.

Company executives are increasingly confident in the economy’s trajectory. The Business Roundtable’s economic-outlook index—a composite of large companies’ plans for hiring and spending, as well as sales projections—increased by nine points in the second quarter to 116, just below 2018’s record high, according to a survey conducted between May 25 and June 9. In the second quarter, the share of companies planning to boost capital investment increased to 59% from 57% in the first.

“We’re seeing really strong reopening demand, and a lot of times capital investment follows that,” said Joe Song, senior U.S. economist at BofA Securities.

Mr. Song added that less uncertainty regarding trade tensions between the U.S. and China should further underpin business confidence and investment. “At the very least, businesses will understand the strategy that the Biden administration is trying to follow and will be able to plan around that,” he said.

#### Decline cascades---nuclear war

Dr. Mathew Maavak 21, PhD in Risk Foresight from the Universiti Teknologi Malaysia, External Researcher (PLATBIDAFO) at the Kazimieras Simonavicius University, Expert and Regular Commentator on Risk-Related Geostrategic Issues at the Russian International Affairs Council, “Horizon 2030: Will Emerging Risks Unravel Our Global Systems?”, Salus Journal – The Australian Journal for Law Enforcement, Security and Intelligence Professionals, Volume 9, Number 1, p. 2-8

Various scholars and institutions regard global social instability as the greatest threat facing this decade. The catalyst has been postulated to be a Second Great Depression which, in turn, will have profound implications for global security and national integrity. This paper, written from a broad systems perspective, illustrates how emerging risks are getting more complex and intertwined; blurring boundaries between the economic, environmental, geopolitical, societal and technological taxonomy used by the World Economic Forum for its annual global risk forecasts. Tight couplings in our global systems have also enabled risks accrued in one area to snowball into a full-blown crisis elsewhere. The COVID-19 pandemic and its socioeconomic fallouts exemplify this systemic chain-reaction. Onceinexorable forces of globalization are rupturing as the current global system can no longer be sustained due to poor governance and runaway wealth fractionation. The coronavirus pandemic is also enabling Big Tech to expropriate the levers of governments and mass communications worldwide. This paper concludes by highlighting how this development poses a dilemma for security professionals.

Key Words: Global Systems, Emergence, VUCA, COVID-9, Social Instability, Big Tech, Great Reset

INTRODUCTION

The new decade is witnessing rising volatility across global systems. Pick any random “system” today and chart out its trajectory: Are our education systems becoming more robust and affordable? What about food security? Are our healthcare systems improving? Are our pension systems sound? Wherever one looks, there are dark clouds gathering on a global horizon marked by volatility, uncertainty, complexity and ambiguity (VUCA).

But what exactly is a global system? Our planet itself is an autonomous and selfsustaining mega-system, marked by periodic cycles and elemental vagaries. Human activities within however are not system isolates as our banking, utility, farming, healthcare and retail sectors etc. are increasingly entwined. Risks accrued in one system may cascade into an unforeseen crisis within and/or without (Choo, Smith & McCusker, 2007). Scholars call this phenomenon “emergence”; one where the behaviour of intersecting systems is determined by complex and largely invisible interactions at the substratum (Goldstein, 1999; Holland, 1998).

The ongoing COVID-19 pandemic is a case in point. While experts remain divided over the source and morphology of the virus, the contagion has ramified into a global health crisis and supply chain nightmare. It is also tilting the geopolitical balance. China is the largest exporter of intermediate products, and had generated nearly 20% of global imports in 2015 alone (Cousin, 2020). The pharmaceutical sector is particularly vulnerable. Nearly “85% of medicines in the U.S. strategic national stockpile” sources components from China (Owens, 2020).

An initial run on respiratory masks has now been eclipsed by rowdy queues at supermarkets and the bankruptcy of small businesses. The entire global population – save for major pockets such as Sweden, Belarus, Taiwan and Japan – have been subjected to cyclical lockdowns and quarantines. Never before in history have humans faced such a systemic, borderless calamity.

COVID-19 represents a classic emergent crisis that necessitates real-time response and adaptivity in a real-time world, particularly since the global Just-in-Time (JIT) production and delivery system serves as both an enabler and vector for transboundary risks. From a systems thinking perspective, emerging risk management should therefore address a whole spectrum of activity across the economic, environmental, geopolitical, societal and technological (EEGST) taxonomy. Every emerging threat can be slotted into this taxonomy – a reason why it is used by the World Economic Forum (WEF) for its annual global risk exercises (Maavak, 2019a). As traditional forces of globalization unravel, security professionals should take cognizance of emerging threats through a systems thinking approach.

METHODOLOGY

An EEGST sectional breakdown was adopted to illustrate a sampling of extreme risks facing the world for the 2020-2030 decade. The transcendental quality of emerging risks, as outlined on Figure 1, below, was primarily informed by the following pillars of systems thinking (Rickards, 2020):

• Diminishing diversity (or increasing homogeneity) of actors in the global system (Boli & Thomas, 1997; Meyer, 2000; Young et al, 2006);

• Interconnections in the global system (Homer-Dixon et al, 2015; Lee & Preston, 2012);

• Interactions of actors, events and components in the global system (Buldyrev et al, 2010; Bashan et al, 2013; Homer-Dixon et al, 2015); and

• Adaptive qualities in particular systems (Bodin & Norberg, 2005; Scheffer et al, 2012) Since scholastic material on this topic remains somewhat inchoate, this paper buttresses many of its contentions through secondary (i.e. news/institutional) sources.

ECONOMY

According to Professor Stanislaw Drozdz (2018) of the Polish Academy of Sciences, “a global financial crash of a previously unprecedented scale is highly probable” by the mid- 2020s. This will lead to a trickle-down meltdown, impacting all areas of human activity.

The economist John Mauldin (2018) similarly warns that the “2020s might be the worst decade in US history” and may lead to a Second Great Depression. Other forecasts are equally alarming. According to the International Institute of Finance, global debt may have surpassed $255 trillion by 2020 (IIF, 2019). Yet another study revealed that global debts and liabilities amounted to a staggering $2.5 quadrillion (Ausman, 2018). The reader should note that these figures were tabulated before the COVID-19 outbreak.

The IMF singles out widening income inequality as the trigger for the next Great Depression (Georgieva, 2020). The wealthiest 1% now own more than twice as much wealth as 6.9 billion people (Coffey et al, 2020) and this chasm is widening with each passing month. COVID-19 had, in fact, boosted global billionaire wealth to an unprecedented $10.2 trillion by July 2020 (UBS-PWC, 2020). Global GDP, worth $88 trillion in 2019, may have contracted by 5.2% in 2020 (World Bank, 2020).

As the Greek historian Plutarch warned in the 1st century AD: “An imbalance between rich and poor is the oldest and most fatal ailment of all republics” (Mauldin, 2014). The stability of a society, as Aristotle argued even earlier, depends on a robust middle element or middle class. At the rate the global middle class is facing catastrophic debt and unemployment levels, widespread social disaffection may morph into outright anarchy (Maavak, 2012; DCDC, 2007).

Economic stressors, in transcendent VUCA fashion, may also induce radical geopolitical realignments. Bullions now carry more weight than NATO’s security guarantees in Eastern Europe. After Poland repatriated 100 tons of gold from the Bank of England in 2019, Slovakia, Serbia and Hungary quickly followed suit.

According to former Slovak Premier Robert Fico, this erosion in regional trust was based on historical precedents – in particular the 1938 Munich Agreement which ceded Czechoslovakia’s Sudetenland to Nazi Germany. As Fico reiterated (Dudik & Tomek, 2019):

“You can hardly trust even the closest allies after the Munich Agreement… I guarantee that if something happens, we won’t see a single gram of this (offshore-held) gold. Let’s do it (repatriation) as quickly as possible.” (Parenthesis added by author).

President Aleksandar Vucic of Serbia (a non-NATO nation) justified his central bank’s gold-repatriation program by hinting at economic headwinds ahead: “We see in which direction the crisis in the world is moving” (Dudik & Tomek, 2019). Indeed, with two global Titanics – the United States and China – set on a collision course with a quadrillions-denominated iceberg in the middle, and a viral outbreak on its tip, the seismic ripples will be felt far, wide and for a considerable period.

A reality check is nonetheless needed here: Can additional bullions realistically circumvallate the economies of 80 million plus peoples in these Eastern European nations, worth a collective $1.8 trillion by purchasing power parity? Gold however is a potent psychological symbol as it represents national sovereignty and economic reassurance in a potentially hyperinflationary world. The portents are clear: The current global economic system will be weakened by rising nationalism and autarkic demands. Much uncertainty remains ahead. Mauldin (2018) proposes the introduction of Old Testament-style debt jubilees to facilitate gradual national recoveries. The World Economic Forum, on the other hand, has long proposed a “Great Reset” by 2030; a socialist utopia where “you’ll own nothing and you’ll be happy” (WEF, 2016).

In the final analysis, COVID-19 is not the root cause of the current global economic turmoil; it is merely an accelerant to a burning house of cards that was left smouldering since the 2008 Great Recession (Maavak, 2020a). We also see how the four main pillars of systems thinking (diversity, interconnectivity, interactivity and “adaptivity”) form the mise en scene in a VUCA decade.

ENVIRONMENTAL

What happens to the environment when our economies implode? Think of a debt-laden workforce at sensitive nuclear and chemical plants, along with a concomitant surge in industrial accidents? Economic stressors, workforce demoralization and rampant profiteering – rather than manmade climate change – arguably pose the biggest threats to the environment. In a WEF report, Buehler et al (2017) made the following pre-COVID-19 observation:

The ILO estimates that the annual cost to the global economy from accidents and work-related diseases alone is a staggering $3 trillion. Moreover, a recent report suggests the world’s 3.2 billion workers are increasingly unwell, with the vast majority facing significant economic insecurity: 77% work in part-time, temporary, “vulnerable” or unpaid jobs.

Shouldn’t this phenomenon be better categorized as a societal or economic risk rather than an environmental one? In line with the systems thinking approach, however, global risks can no longer be boxed into a taxonomical silo. Frazzled workforces may precipitate another Bhopal (1984), Chernobyl (1986), Deepwater Horizon (2010) or Flint water crisis (2014). These disasters were notably not the result of manmade climate change. Neither was the Fukushima nuclear disaster (2011) nor the Indian Ocean tsunami (2004). Indeed, the combustion of a long-overlooked cargo of 2,750 tonnes of ammonium nitrate had nearly levelled the city of Beirut, Lebanon, on Aug 4 2020. The explosion left 204 dead; 7,500 injured; US$15 billion in property damages; and an estimated 300,000 people homeless (Urbina, 2020). The environmental costs have yet to be adequately tabulated.

Environmental disasters are more attributable to Black Swan events, systems breakdowns and corporate greed rather than to mundane human activity.

Our JIT world aggravates the cascading potential of risks (Korowicz, 2012). Production and delivery delays, caused by the COVID-19 outbreak, will eventually require industrial overcompensation. This will further stress senior executives, workers, machines and a variety of computerized systems. The trickle-down effects will likely include substandard products, contaminated food and a general lowering in health and safety standards (Maavak, 2019a). Unpaid or demoralized sanitation workers may also resort to indiscriminate waste dumping. Many cities across the United States (and elsewhere in the world) are no longer recycling wastes due to prohibitive costs in the global corona-economy (Liacko, 2021).

Even in good times, strict protocols on waste disposals were routinely ignored. While Sweden championed the global climate change narrative, its clothing flagship H&M was busy covering up toxic effluences disgorged by vendors along the Citarum River in Java, Indonesia. As a result, countless children among 14 million Indonesians straddling the “world’s most polluted river” began to suffer from dermatitis, intestinal problems, developmental disorders, renal failure, chronic bronchitis and cancer (DW, 2020). It is also in cauldrons like the Citarum River where pathogens may mutate with emergent ramifications.

On an equally alarming note, depressed economic conditions have traditionally provided a waste disposal boon for organized crime elements. Throughout 1980s, the Calabriabased ‘Ndrangheta mafia – in collusion with governments in Europe and North America – began to dump radioactive wastes along the coast of Somalia. Reeling from pollution and revenue loss, Somali fisherman eventually resorted to mass piracy (Knaup, 2008).

The coast of Somalia is now a maritime hotspot, and exemplifies an entwined form of economic-environmental-geopolitical-societal emergence. In a VUCA world, indiscriminate waste dumping can unexpectedly morph into a Black Hawk Down incident. The laws of unintended consequences are governed by actors, interconnections, interactions and adaptations in a system under study – as outlined in the methodology section.

Environmentally-devastating industrial sabotages – whether by disgruntled workers, industrial competitors, ideological maniacs or terrorist groups – cannot be discounted in a VUCA world. Immiserated societies, in stark defiance of climate change diktats, may resort to dirty coal plants and wood stoves for survival. Interlinked ecosystems, particularly water resources, may be hijacked by nationalist sentiments. The environmental fallouts of critical infrastructure (CI) breakdowns loom like a Sword of Damocles over this decade.

GEOPOLITICAL

The primary catalyst behind WWII was the Great Depression. Since history often repeats itself, expect familiar bogeymen to reappear in societies roiling with impoverishment and ideological clefts. Anti-Semitism – a societal risk on its own – may reach alarming proportions in the West (Reuters, 2019), possibly forcing Israel to undertake reprisal operations inside allied nations. If that happens, how will affected nations react? Will security resources be reallocated to protect certain minorities (or the Top 1%) while larger segments of society are exposed to restive forces? Balloon effects like these present a classic VUCA problematic.

Contemporary geopolitical risks include a possible Iran-Israel war; US-China military confrontation over Taiwan or the South China Sea; North Korean proliferation of nuclear and missile technologies; an India-Pakistan nuclear war; an Iranian closure of the Straits of Hormuz; fundamentalist-driven implosion in the Islamic world; or a nuclear confrontation between NATO and Russia. Fears that the Jan 3 2020 assassination of Iranian Maj. Gen. Qasem Soleimani might lead to WWIII were grossly overblown. From a systems perspective, the killing of Soleimani did not fundamentally change the actor-interconnection-interaction adaptivity equation in the Middle East. Soleimani was simply a cog who got replaced.

### 1NC---OFF

#### **Plan: The Republic of India should ban the appropriation of outer space by private entities except for PIXXEL.**

#### **PIXXEL is key to accurate enviro monitoring.**

Billington 21[Francesca Billington, She graduated from Princeton in 2019 with a degree in anthropology.March 17, 2021, "Pixxel Promises to Deliver the World's Highest Resolution Satellite Images," dot.LA, https://dot.la/hyperspectral-imaging-2651120389.html]/ISEE

With plans to launch the world's highest resolution earth imaging satellite, Pixxel emerged from stealth mode on Wednesday. The constellation — once deployed — will give 24-hour global coverage to generate data that could be used by agriculture companies and governments to monitor environmental conditions on Earth. "We are very excited to finally speak about what we are building at Pixxel," said co-founder and CEO Awais Ahmed in a statement. "This enables us to capture some of the richest imagery that's ever been beamed down to earth." Backed by Omnivore VC, Techstars and a roster of previous investors, the Los Angeles and Bangalore-based startup also announced a $7.3 million seed round, an extension of its $5 million boost last August. The two-year-old company got its start through the Techstars Starburst Space accelerator. Using hyperspectral imaging, the startup said its satellites can cheaply collect more detailed images to help experts working across agriculture, energy and environmental conservation. The data will be aimed at governments, as well as agriculture and oil companies that need to keep an eye on environmental factors impacting their land. The imaging is designed to pick up on issues "invisible to today's satellites," the company said, allowing it to flag pest infestations and crop diseases, or detecting oil spills and gas leaks. The first satellite is slated to launch and orbit within the next few months. "These hyperspectral satellites will allow society to tackle many of humanity's most pressing issues," Ahmed said. "Empowering humans to see the earth like never before." The company has so far partnered with the Indian Space Research Organization, the U.S. Air Force and NASA's Jet Propulsion Laboratory.

**Sats are critical towards solving climate change**

**Freedman, 9-4** (Andrew Freedman is a climate and energy reporter for Axios, covering climate change and holds a Masters in Law and Diplomacy from the Fletcher School at Tufts University, and a Masters in Climate and Society from Columbia University, 9-4-2021, accessed on 9-4-2021, Axios, "Space will be even more critical to climate science in 2051", https://www.axios.com/space-critical-to-climate-science-2051-0361889a-5ae9-47eb-960f-e83f1b6779c7.html, HBisevac)

A growing constellation of satellites that can peer deep beneath the Earth's surface, track global sea level rise in unprecedented detail, and trace pollutants in the air will **bolster climate science** in the coming decades. Why it matters:The next few decades are critical for determining the pace and severity of climate change, and efforts to deploy new technologies to cut emissions to net negative numbers will require **new planetary monitoring capabilities**. Precise measurements of sea level rise, ocean currents and changes in ice sheet elevation can also alert us to the triggering of potentially **devastating tipping points** in the climate system. What's happening:The U.S., Europe, India and China are planning their next generation of weather and climate satellites. Private companies and nonprofits, such as Planet, IceEye and Carbon Mapper, are also playing a growing role — providing data to companies and to governments. The big picture:By 2050, assuming current Earth-observing platforms continue into the future, climate researchers will have... Nearly 70 years of reliable data on sea level rise. More than 80 years of records on land use change. More than 60 years of monitoring mass changes in polar ice sheets as well as the depletion of groundwater aquifers, and more. What's next:The list of Earth-sensing satellites NASA plans to launch in the next decade reflects the **ongoing need** to monitor conditions that affect climate change. These include getting a better idea of the role that aerosols, which are tiny particles of various sources — from sea spray to airborne dust and pollutants —are playing in warming or cooling the globe. How aerosols are affecting clouds is one of the biggest uncertainties involved in future climate projections, NASA’s chief climate adviser Gavin Schmidt tells Axios. One component of NASA’s suite of next generation of Earth science satellites, collectively known as the Earth System Observatory, will focus on aerosols. Another NASA satellite, NISAR, which is being completed in collaboration with the Indian Space Research Organisation (ISRO), will be able to measure minute changes in Earth’s surface, including ice sheet movement, volcanic activity and earthquakes.“It’s **absolutely key** for mapping the vertical land component of sea level rise at any one place,” Schmidt says, noting cities that are sinking as seas are rising, like Jakarta, would benefit from this information. NASA is also planning a mission to study the land surface, including vegetation of the planet, and a new gravity-sensing mission to keep tabs on melting ice sheets.

#### It's the only method of effective mitigation

**Hassani et al., 19** (Hossein Hassani does computer science and engineering at University of Kurdistan Hewlêr, Xu Huang is the chair professor of the Department of Management and associate dean and program director of the School of Business at Hong Kong Baptist University, and Emmanuel Silva is the recipient of a BSc (Hons) Economics and Actuarial Science, an MSc Risk Management from the University of Southampton, and a Ph.D. in Statistics from the Bournemouth University and is recognized as a Fellow of the Higher Education Academy in the UK, 2-2-2019, accessed on 9-27-2021, Big Data and Cognitive Computing, "Big Data and Climate", doi: 10.3390/bdcc3010012, HBisevac)

Big data analytics have been rapidly developing along with the emerging needs of big data technologies in numerous subjects (see, for example, [1,2]). **The accessibility, availability and exponentially growing quantity of big data have further promoted the corresponding technological advancements and practical implementations**. Earth is a complex dynamical system [3]; thereafter, big data analytics encountered more challenges in climate science than other subjects regardless of the extensive resources of big climate data. Climate change as an emerging topic and also a data-intensive subject has been the research focus of big data scholars over the past several decades [4,5]. Exhaustive big data analytics applications have been carried out on big climate data, while the Internet of Things, cloud computing, big data tools to investigate climate, as well as intelligent analytics platforms and new technological progressions, have further emphasized its significance and possible impacts on climate science and big data science development (see, for example, [6,7]). Given the context of combating climate change, existing research has applied big data analytics in mainly the aspects of energy efficiency, intelligent agriculture, smart urban planning, weather forecast, natural disaster management, etc. Although overall this is not a new subject and there is a large amount of existing literature, there is no recent review to the best of our knowledge that particularly investigates the topic of big data in climate change, not to mention that the novel developments are progressing rapidly everyday along with the technological advancements. Therefore, this paper contributes to the existing literature by providing the most up-to-date overview of big data applications in climate change related studies at a glance with the most recently published research that reflects the cutting edge of this topic. It is of note that over 80% of the listed applications are after 2016, which makes this review the latest comprehensive review of big data in climate change that is significantly different from the previously existing literature. This paper also contributes by serving as the one stop directory for researchers to gain the most up-to-date overview of this topic. Furthermore, we aim to summarize the popular practice court of research in this domain, and also seek to identify the non-mainstream applications that lack thorough exploration. It is expected that, by providing this comprehensive review, both researchers and practitioners can gain better knowledge of the current research trend and identify the research gaps with valuable potential. As can be seen in Figure 1, it is identified that the applications of big data in climate change have two fundamental elements: the big climate data resources and the big data analytics techniques. We classify these studies by means of value creation as well as the specific topic of application. For convenient access of applications and clear guiding purposes, it is summarized that big data in climate change mainly function in four aspects of value creation: observing and monitoring, understanding, and predicting and optimizing, whilst the applications are grouped into five topics: energy efficiency and intelligence; smart farming and agriculture and forestry; sustainable urban planning and infrastructure; natural disaster and disease assessment; and other advanced supports. The remainder of this review paper is organized such that the values of big data to climate change study are summarized in Section 2 along with the trends of this focused topic. Section 3 lists a detailed review of the big data applications in climate change studies by topics. Finally, the paper concludes in Section 4 with current challenges and directions of future research.

2. Values of Big Data to Climate Change Study

2.1. Observing and Monitoring

One of the insights big data can bring is thoroughly revealing the realities from the large volume of data recorded. The exceptionally large sources of data contain **significantly useful information** and is also the fundamental asset of big data analyses. Monitoring the climate system is critical for better understanding the interactions within the system and its drives, respectively. Moreover, it is also beneficial for us to know the changes that may occur due to the global warming [3]. Thereafter, observing and monitoring can be considered as the **fundamental value** that big data brings along when it is incorporated with climate change study. In order to obtain thorough observation and comprehensive parameters of climate change, **earth observation technology** has played a **significant part** over the past decades [8]. A multi-dimensional big data system has been established and is still promptly developing, which has enabled us to observe and monitor changes on a global scale of **diverse earth and climate parameters**. According to [3], the climate data have generally four different sources: in situ, remote sensed, model output and paleoclimatic. A more detailed review of the climate data sources and corresponding features can be found in [9]. Later, Guo et al. [8] has thoroughly reviewed the Earth observation big data sources and relevant programs; for instance, the satellites that are working in climate change research and their functions, the remotely sensed oceanographic parameters and representative sensors, the essential climate variables by the United Nations Framework Convention on Climate Change, the atmospheric parameters by different international agencies, etc. Specifically, Sun et al. [10] provided a review of the global precipitation data sets regarding its sources and comparisons.

2.2. Understanding, Predicting and Optimizing

In the context of the nature of climate science, which investigates the tremendous global scale changes of various observations/parameters, its 3Hs feature (high dimension, high complexity and high uncertainty) has made it a great playground for big data researchers to explore and analyse even before proceeding to data mining. Besides the building up the multidimensional system of collecting and monitoring climate change, big data has also promoted the rapid progression of data-intensive analytics in climate change related studies. Here, we briefly categorizes them into the aspects of understanding, predicting and optimizing. Understanding the big data (or data empathy) according to [3]) is a challenging task considering its 5Vs feature (volume, variety, velocity, veracity and value), revealing the hidden valuable information from big data requires adequate knowledge of the purposes of corresponding data as well as the techniques/methods for collecting the data. As a trending and emerging topic, big data researchers who are also interested in climate sciences have been exposed to abundant established resources, for instance, the Global Climate Observing System (GCOS), Earth System Grid Federation (esgf.llnl.gov), the National Center for Atmospheric Research (ncar.ucar.edu), United Nations Global Pulse (unglobalpulse.org), the Climate Data Guide (climatedataguide.ucar.edu), NASA Global Climate Change (climate.nasa.gov), the NASA Center for Climate Simulation (nccs.nasa.gov) and many other international and national climate monitoring and analysing institutions over the world. A detailed report that introduces the core of global scale climate research and cyber-infrastructure can be found in [11]. The abundant resources above have enabled us to gain knowledge of what the big climate data are how the data are collected, and what the data can be used for. However, these barely scratch the surface of big data analytics. Big data have also been playing a **vital role in predicting when it is incorporated with climate science**, for instance weather forecasting, natural disasters monitoring and early warning, energy consumption forecasting, traffic forecasting, etc. By applying corresponding data mining techniques (the detailed introduction of data mining techniques can be found in [12,13]), it allows knowledge discovery of the potential relationships and causal inferences, which further contribute to the modelling and predicting [14]. Accurate forecasts can aid in adaptive policy making in relation to climate changes, whilst the value creation feature of big data puts emphasis on optimizing. Being able to understand and predict based on sufficient knowledge extracted from big data or drawing inferences across different cases/applications are relatively straightforward. However, **optimization requires comprehensive theoretical understanding as well as adequate big data** analytics skills to structure the optimal model/infrustructure so as to maximise performance, efficiency and utility, or, in some cases, for achieving sustainable development. In recent years, exhaustive relevant applications have been carried out on energy efficiency management, natural resource management, smart grid, smart farming, etc. More details of applications are provided in Section 3

#### Climate Change causes extinction and is an impact filter---prefer ev from scientific experts

Phoebe Weston 21 (Phoebe Weston is a biodiversity writer for the Guardian, 1/13/21, accessed 10/16/21, “Top scientists warn of 'ghastly future of mass extinction' and climate disruption”, https://www.theguardian.com/environment/2021/jan/13/top-scientists-warn-of-ghastly-future-of-mass-extinction-and-climate-disruption-aoe)AGabay

The planet is facing a “**ghastly future of mass extinction**, declining **health** and **climate-disruption upheavals**” that threaten **human survival** because of ignorance and inaction, according to an international group of scientists, who warn people still haven’t grasped the urgency of the biodiversity and **climate crises**. The **17 experts**, including Prof Paul Ehrlich from Stanford University, author of The Population Bomb, and scientists from Mexico, Australia and the US, say the planet is in a much **worse state** than most **people** – even scientists – **understood**. “The **scale** of the threats to the **biosphere** and **all its lifeforms** – including **humanity** – is in fact **so great** that it is **difficult** to **grasp** for even well-informed experts,” they write in a report in Frontiers in Conservation Science which **references more than 150 studies** detailing the world’s major environmental challenges. The delay between **destruction** of the **natural world** and the **impacts** of these actions means people **do not recognise** how **vast** the **problem is**, the paper argues. “[The] mainstream is having difficulty grasping the magnitude of this loss, despite the steady erosion of the fabric of human civilisation.” The report warns that climate-induced **mass migrations**, **more** **pandemics** and **conflicts** over resources will be **inevitable unless** urgent action is **taken**. “Ours is not a call to surrender – we aim to provide leaders with a realistic ‘cold shower’ of the state of the planet that is essential for planning to avoid a ghastly future,” it adds. Dealing with the enormity of the problem requires far-reaching changes to global capitalism, education and equality, the paper says. These include abolishing the idea of perpetual economic growth, properly pricing environmental externalities, stopping the use of fossil fuels, reining in corporate lobbying, and empowering women, the researchers argue. The report comes months after the world failed to meet a single UN Aichi biodiversity target, created to stem the destruction of the natural world, the second consecutive time governments have failed to meet their 10-year biodiversity goals. This week a coalition of more than 50 countries pledged to protect almost a third of the planet by 2030. An estimated one million species are at risk of extinction, many within decades, according to a recent UN report. “**Environmental deterioration** is infinitely more **threatening** to **civilisation** than **Trumpism** or **Covid-19**,” Ehrlich told the Guardian. In The Population Bomb, published in 1968, Ehrlich warned of imminent population explosion and hundreds of millions of people starving to death. Although he has acknowledged some timings were wrong, he has said he stands by its fundamental message that population growth and high levels of consumption by wealthy nations is driving destruction. He told the Guardian: “Growthmania is the fatal disease of civilisation - it must be replaced by campaigns that make equity and well-being society’s goals - not consuming more junk.” Large populations and their continued growth drive soil degradation and biodiversity loss, the new paper warns. “More people means that more synthetic compounds and dangerous throwaway plastics are manufactured, many of which add to the growing toxification of the Earth. It also increases the chances of pandemics that fuel ever-more desperate hunts for scarce resources.” The effects of the climate emergency are more **evident** than biodiversity loss, but still, society is **failing to cut emissions**, the paper argues. If people understood the magnitude of the crises, changes in politics and policies could match the gravity of the threat. “Our main point is that once you realise the scale and imminence of the problem, it becomes clear that we need much more than individual actions like using less plastic, eating less meat, or flying less. Our point is that we need big systematic changes and fast,” Professor Daniel Blumstein from the University of California Los Angeles, who helped write the paper, told the Guardian. The paper cites a number of key reports **published** in the past few years **including**: The **World Economic Forum** report in 2020, which named biodiversity loss as one of the top threats to the global economy. The 2019 **IPBES Global Assessment report** which said **70%** of the planet had been **altered by humans**. The 2020 WWF **Living Planet report**, which said the average population size of vertebrates had declined by 68% in the past five decades. A 2018 **Intergovernmental Panel on Climate Change report** which said that humanity had already exceeded global warming of 1C above pre-industrial levels and is set to reach 1.5C warming between 2030 and 2052. The report **follows** years of stark **warnings** about the **state** of the **planet** from the world’s **leading scientists**, including a statement by **11,000 scientists** in **2019** that people will face “untold suffering due to the **climate crisis**” unless major changes are made. In 2016, more than 150 of Australia’s climate scientists wrote an open letter to the then prime minister, Malcolm Turnbull, demanding immediate action on reducing emissions. In the same year, 375 scientists – including 30 Nobel prize winners – wrote an open letter to the world about their frustrations over political inaction on climate change.

#### **Yes we compete!**

Arakali 21[Harichandan Arakali,Technology Editor at Forbes India, 12-15-2021, "Forbes India," Forbes India, https://www.forbesindia.com/article/take-one-big-story-of-the-day/indian-space-startups-ready-for-take-off-in-2022/72217/1]/ISEE

Awais Ahmed has come a long way from the astronomy book, and later a telescope, his father gave him as a schoolboy. If all goes as planned, the first demonstration satellite at Pixxel, the satellite data company that Ahmed and his friend Kshitij Khandelwal started in 2019, will be launched atop an Isro (Indian Space Research Organisation) rocket to an orbit some 500 km above Earth as early as January 2022. If that satellite—named Anand to honour the memory of a young intern at Pixxel, who passed away later—proves a success, demonstrating the ‘hyper-spectral’ imaging technology that the company has developed, it will help Pixxel push ahead with its plan of putting up a constellation of 36 micro satellites in what are called low-Earth orbits. Typically in the range of 500 to 550 km above Earth. “The plan is to have a constellation of satellites that can do global coverage on an every day basis so that we are able to see how things are changing daily,” Ahmed tells Forbes India. “In that process, our first satellite has been built, it has been tested, it's ready to launch… we are just waiting for the Isro rocket to get on the launch pad.” Ahmed hopes that in January 2022, Bengaluru’s Pixxel will be able to send it up. And following that, the plan is to launch the first phase of the constellation before the end of the year, which will help the startup to start serving customers around the world. Pixxel is among a clutch of startups coming up in India that reflect the coming together of multiple factors that are set to usher in the private space industry in India—a sector dominated in the country so far by the phenomenal work

### 1NC---OFF

#### States ought to establish or expand an international public trust obligation towards celestial protection.

#### Counterplan solves global space sustainability.

**Babcock ’19** — Hope M. Babcock, Professor of Law, Georgetown University Law Center, B.A., Smith College, L.L.B., Yale University; (2019; “ARTICLE: THE PUBLIC TRUST DOCTRINE, OUTER SPACE, AND THE GLOBAL COMMONS: TIME TO CALL HOME ET”; University of Michigan Libraries, Nexis Uni; *Syracuse University Law Review*, Vol. 69; //LFS—JCM)

[\*259] The doctrine also appears to be infinitely malleable. Original uses of the doctrine were restricted to only that "aspect of the public domain below the low-water mark on the margin of the sea and the great lakes, the waters over those lands, and the waters within rivers and streams of any consequence," 520and covered only traditional uses of those lands, like fishing and navigation. 521 Over time, the scope and application of the doctrine broadened to protect more public resources and different uses. 522 Thus, the doctrine expanded to protect new trust resources, such as dry sand beaches, inland lakes, groundwater, dry riverbeds, and wildlife, 523and passive uses of those resources, like scientific study. 524The original link to navigable water and tidelands disappeared. 525 Supporters of the [\*260] doctrine successfully advocated that it be applied to "wildlife, parks, cemeteries, and even works of fine art," 526 while arguing more recently its application to the atmosphere. 527

A doctrine that imposes a perpetual duty on the sovereign to preserve trust resources, prevents their alienation for private benefit, assures public access to them, and can be invoked by anyone seems particularly useful as a management tool in outer space. 528The fact that public access to trust resources is so central to the doctrine makes it reflective, not contradictory, of international space law's bar against appropriation of outer space and of the principle of space being the "province of all mankind." 529 It avoids the problems of alienation and exclusion associated with any of the management approaches associated with some form of private property and requires neither the creation of a new administrative authority nor the presence of a close-knit group of like-minded people. 530 Members of the public, both rich and poor, can invoke and enforce the doctrine as easily as the sovereign. 531 It is cost effective to the extent that no separate apparatus is required to implement it, and the doctrine has shown itself to be highly adaptable and innovative as different needs arise. 532 It could also fill the gap in international law with respect to managing celestial property. Therefore, of all the management approaches studied here, the PTD seems the most suited to keep order in space until a regulatory regime is imposed.

However, the doctrine provides no incentives for development of trust resources; rather, it might be used to limit or curtail that development, making it an imperfect, perhaps even counter-productive solution by itself to the extent that such development might be [\*261] beneficial. 533Modifying the doctrine to allow limited use of private property management approaches, like tradable development claims, might buffer that effect - a form of overlapping hybridity between one type of property, a commons, and a management regime from another, private property, enabled by application of the PTD.

Conclusion

"Only a legal system that accommodates both the human need for resources and the necessary preservation of mankind's common heritage can fulfill these criteria."534 The future is now with regard to the development of outer space and its resources - it is no longer a question of whether humans will engage in these activities, but how soon they will. Technically advanced countries and private commercial enterprises are probing outer space and preparing for landing on an asteroid or the moon to extract their resources. 535Speculators are selling deeds to the moon's surface and preparing to exploit the tourism potential that space offers. 536 But, the legal framework for managing these initiatives is almost nonexistent. 537International treaties came into being before all this activity began in earnest and national laws that might apply are stunted by jurisdictional quandaries like the absence of national boundaries in outer space. 538Thus, there is an urgency to figure out how to control what happens in outer space before its resources are irreparably damaged or permanently monopolized by powerful countries and individuals.

In the absence of regulation, much of the current debate centers on what property regime should be applied in outer space. 539The assumption is that by only allowing private property rights in space, countries and commercial enterprises will undertake the risks and costs of space development. 540However, unless international space law changes, it may prevent this from happening. If it changes, strong management controls will be necessary to prevent destruction or over-consumption of celestial resources, as well as monopolization and competitive behavior by participants, which could lead to hostilities and inequities.

[\*262] This Article examines various private property regimes, including those of less than full fee ownership, to see if any would avoid the conflict with the international prohibition on appropriation of outer space and its resources. It concludes that none will because each retains the right to exclude and each is insensitive to the treaties' equity concerns. In contrast, considering outer space to be common is consistent with international space law in both respects.

Hypothesizing that private property in outer space may yet prevail, this Article investigates different private property management approaches, such as the right of first possession, lotteries, and tradable development rights, to see if any would be cost effective, easy to implement and equitable, and would also prevent over-consumption, monopolization or the slide into rivalrous behavior. The Article concludes that each comes up short in some respect. Social norms as a management tool for property held in common, although compliant with international law, are also not up to the task. Instead, although ancient, the PTD, with its malleability, easy and cost-effective implementation and enforcement, non-consumption principle, and consistency with the goals that animate international space treaties, seems best suited to the task of protecting the public's interests in the global commons that is outer space as it has done for centuries in Earth-bound commons.

But, as its principal terrestrial use has been to protect trust resources from development, the doctrine needs some modification to encourage development of celestial resources. Hence, this Article suggests that modifying the PTD to allow the application of private property management tools, like tradable development rights, will not only allow development, but also will assure that when it happens, it will not be just profitable for a few, but will also be sustainable and equitable.

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#### The 1AC explicitly rejects capitalism in favor of assertions about unsustainability –

#### Capitalism is good –twowarrants --

#### 1---Space colonization is only possible through growth

Marko Kovic 19 (Marko Kovic is the co-founder president of the nonprofit think tank ZIPAR (Zurich Institute of Public Affairs Research) and the co-founder and CEO of the consulting firm ars cognitionis, March 2019, accessed 11/30/21, “The future of energy”, https://osf.io/preprints/socarxiv/aswz9/download)AGabay

Ideally, the mitigation of climate **risks** will coincide with and contribute to the **development** of improved or even entirely novel sources of energy that will increase the long-term chances of **humankind’s survival** by means of **space colonization**. This is not an **unrealistic expectation**, given that the mitigation of climate risks consists, to a large degree, of replacing fossil fuels with other, less harmful sources of energy. However, some climate change mitigation strategies might actually harm the long-term prospects of humankind. First, it is possible that dominant climate change **mitigation** strategies will actively exclude any form of **nuclear energy** from the repertoire of climatefriendly energy sources. Existing and experimental (molten salt) fission reactors could play a **significant role** in replacing carbon-heavy energy sources, but proenvironmental attitudes often overlap with anti-nuclear sentiments [65]. As a result, and in combination with other problems such as large-scale market failures of existing emission reactors (one of the reasons being that generating electricity from fossil fuels is cheaper) [66], nuclear fission does not currently have significant standing as a “cleantech” contribution to climate change mitigation. From a long-term perspective, an unfavorable view of nuclear energy in the context of climate change might mean that technological progress in the areas of nuclear fission and fusion might come to a halt (for example, due to explicit bans or implicit disincentives). If such a scenario came to be, our attempts at colonizing space would almost certainly **fail**: There are currently no alternatives to **fission** and **fusion**, and it is highly **improbable** that Solar power alone could suffice for sustaining **extraterrestrial habitats**. Second, there is some **probability** that climate change mitigation strategies will change the social order towards a **degrowth** philosophy. Degrowth is a vague socio-economic concept and social movement that, in general, calls for a contraction of the global and national economies by means of **lower production** and **consumption** rates, and, to some degree, to more profound changes to the “**capitalist**” system of economic production [67]. Degrowth or degrowth-like approaches are being actively considered as climate risk mitigation strategies [68, 69], and degrowth would almost certainly be a highly effective measure for mitigating climate change. After all, if we were to drastically reduce or even completely eliminate the (industrial) sources of greenhouse gases, the amount of greenhouse gases that are being emitted would accordingly drastically sink. From the **long-term perspective** of humankind’s survival, degrowth is **problematic** in at least two ways. First, there is a risk that the general contraction of **economic activity** would also slow or **eliminate** **progress** in the domain of energy, which would, in turn, **reduce** the **probability** of successful **space colonization** due to an absence of suitable **energy sources**. Second, and more fundamental: If degrowth were to become a **dominant societal paradigm**, it is **uncertain** whether the longterm **survival** of humankind by means of **space colonization** would be regarded a **desirable** goal. In a literal sense, establishing **extraterrestrial colonies** would mean **growth**; the size of the total human population would **grow**, and the area of space-time that humans occupy would grow. In a more philosophical sense, degrowth might even be **antithetical** to space **colonization**. Even though both degrowth and space colonization have a similar moral goal – increasing wellbeing – , the ends to that goal are very different. Within degrowth philosophy, the goal is, metaphorically speaking, not to “**live beyond our means**”: We should strive for “**ecological balance**”, and such a state should increase the average **wellbeing**. But the frame of **reference** is the **status quo**; Earth and humankind as we know it today. **Space** **colonization**, on the other hand, operates with a much **larger** **frame** of reference: All the **future generations** of humans (and other sentient beings) who could enjoy wellbeing if we succeed in colonizing space – and who will categorically be denied that **wellbeing** if we fail to colonize space [70]. The goal of space colonization as a moral project is not to live beyond our **means**, but to actively **redefine** and expand what our **means** are through **scientific** and **technological** **progress**.

#### Otherwise inevitable extinction.

Zarkadakis ’19 [George; December 26; Ph.D. in Artificial Intelligence; George Zardakis, “Abandoning the metropolis: space colonisation as the new imperative,” <https://georgezarkadakis.com/2019/12/26/abandoning-the-metropolis-space-colonisation-as-the-new-imperative/>]

Space colonization is not only the subject of fiction but of serious science too. The late physicist Stephen Hawking argued that unless colonies were established in space the human race would become extinct. There are several natural phenomena beyond our control that could spell our obliteration. Over a long enough period of time our planet is vulnerable to catastrophic meteorite strikes, or getting exposed to the deadly radiation of a nearby supernova explosion. As our Sun burns its fuel it will start to expand and, in a few million years, will scorch Earth. We can also self-destruct by waging nuclear war, or by tilting our planet’s climate towards a runaway greenhouse effect. Space colonization is therefore the ultimate insurance policy of long-term human survival[4]. Physics and Biology: how to solve the challenges of interstellar travel But colonizing space is hard. Three are the main problem categories for humans surviving away from Earth over an indefinite period of time. The first, and probably easiest to solve, is finding a place suitable for colonization. Our solar system provides several possible habitats, the most obvious ones being of course the Moon and Mars. The Jovian moons could also be colonization targets. The Artemis Project[5], a private venture to establish a permanent, self-sustainable human base on the Moon, has proposed the Jovian moon Europa as an alternative future habitat, given the possibility of a hot interior and a liquid ocean of water under the icy surface, both of which could provide for a sustainable human base. Colonizing the Solar System could be a stepping-stone for venturing to worlds beyond, of which there are aplenty. In 2009 NASA launched the Kepler space telescope to discover Earth-size planets orbiting other stars in habitable zones. More than 1,300 planets have been discovered so far, in about 440 star systems; the nearest planet may be “only” 12 light years away. Based on Kepler’s findings scientists estimate that there could be as many as 11 billion rocky, Earth-like planets orbiting habitable zones of Sun-like stars in our Galaxy. The possibilities for expanding humanity’s reach in the cosmos are truly astronomical. The second problem category is how to get to these other worlds: space travel is a hugely challenging technological problem. After more than six decades of space engineering we are still dependent of heavy rockets that burn chemical fuel to get us out of the Earth’s gravity. Perhaps the greatest innovation so far is the reusable rockets pioneered by Elon Musk’s Falcon 9 and Jeff Bezos’s Charon. Having reusable rockets significantly lowers the cost of space flight. According to Elon Musk it costs $60 million to make the Falcon 9, and $200,000 to refuel it, so theoretically by reusing a rocket multiple times the cost of each flight lowers every time it flies. There are of course additional costs for refurbishment after each flight that must be factored in, but reusing rockets looks like the most practical way to advance space technology today. Alternatively, we could have a space elevator carrying people and equipment on low orbit, an idea envisioned by the pioneering Russian scientist Konstantin Tsiolkovsky back in 1895. Researchers in Japan’s Shizuoka University are presently advancing the concept by using two mini satellites to test elevator motion in space. Moreover, the Obayashi Corporation, which will build Japan’s largest tower, has put together a space elevator proposal that will take people from Earth to an orbiting space station. However, the solution requires 60,000 miles of cable made of carbon nanotubes or an as-yet undeveloped material. Owing to developments in quantum computing in the next ten years, we may be able to exponentially advance the production of materials for constructing space elevators, as well as for developing new rocket fuels; and thus dramatically reduce the cost of space flight. By harnessing near-infinite computing power and accessing calculations at quantum level physicists may be able to unlock the mysteries of dark matter and dark energy, and probe deeper into the fundamental structure the universe.

#### 2---War---crash causes it

Liu ’18 [Qian; November 2; Economist, Managing Director at Greater China, citing the economist Thomas Piketty and political scientist Samuel Huntington; Project Syndicate, “From economic crisis to World War III,” p. 1-2; RP]

The next economic crisis is closer than you think. But what you should really worry about is what comes after: in the current social, political, and technological landscape, a prolonged economic crisis, combined with rising income inequality, could well escalate into a major global military conflict. The 2008-09 global financial crisis almost bankrupted governments and caused systemic collapse. Policymakers managed to pull the global economy back from the brink, using massive monetary stimulus, including quantitative easing and near-zero (or even negative) interest rates. But monetary stimulus is like an adrenaline shot to jump-start an arrested heart; it can revive the patient, but it does nothing to cure the disease. Treating a sick economy requires structural reforms, which can cover everything from financial and labour markets to tax systems, fertility patterns, and education policies. Policymakers have utterly failed to pursue such reforms, despite promising to do so. Instead, they have remained preoccupied with politics. From Italy to Germany, forming and sustaining governments now seems to take more time than actual governing. Greece, for example, has relied on money from international creditors to keep its head (barely) above water, rather than genuinely reforming its pension system or improving its business environment. The lack of structural reform has meant that the unprecedented excess liquidity that central banks injected into their economies was not allocated to its most efficient uses. Instead, it raised global asset prices to levels even higher than those prevailing before 2008. In the United States, housing prices are now 8% higher than they were at the peak of the property bubble in 2006, according to the property website Zillow. The price-to-earnings (CAPE) ratio, which measures whether stock-market prices are within a reasonable range, is now higher than it was both in 2008 and at the start of the Great Depression in 1929. As monetary tightening reveals the vulnerabilities in the real economy, the collapse of asset-price bubbles will trigger another economic crisis – one that could be even more severe than the last, because we have built up a tolerance to our strongest macroeconomic medications. A decade of regular adrenaline shots, in the form of ultra-low interest rates and unconventional monetary policies, has severely depleted their power to stabilise and stimulate the economy. If history is any guide, the consequences of this mistake could extend far beyond the economy. According to Harvard’s Benjamin Friedman, prolonged periods of economic distress have been characterised also by public antipathy toward minority groups or foreign countries – attitudes that can help to fuel unrest, terrorism, or even war. For example, during the Great Depression, US President Herbert Hoover signed the 1930 Smoot-Hawley Tariff Act, intended to protect American workers and farmers from foreign competition. In the subsequent five years, global trade shrank by two-thirds. Within a decade, World War II had begun. To be sure, WWII, like World War I, was caused by a multitude of factors; there is no standard path to war. But there is reason to believe that high levels of inequality can play a significant role in stoking conflict. According to research by the economist Thomas Piketty, a spike in income inequality is often followed by a great crisis. Income inequality then declines for a while, before rising again, until a new peak – and a new disaster. Though causality has yet to be proven, given the limited number of data points, this correlation should not be taken lightly, especially with wealth and income inequality at historically high levels. This is all the more worrying in view of the numerous other factors stoking social unrest and diplomatic tension, including technological disruption, a record-breaking migration crisis, anxiety over globalisation, political polarisation, and rising nationalism. All are symptoms of failed policies that could turn out to be trigger points for a future crisis. Voters have good reason to be frustrated, but the emotionally appealing populists to whom they are increasingly giving their support are offering ill-advised solutions that will only make matters worse. For example, despite the world’s unprecedented interconnectedness, multilateralism is increasingly being eschewed, as countries – most notably, Donald J. Trump’s US – pursue unilateral, isolationist policies. Meanwhile, proxy wars are raging in Syria and Yemen. Against this background, we must take seriously the possibility that the next economic crisis could lead to a large-scale military confrontation. By the logic of the political scientist Samuel Huntington, considering such a scenario could help us avoid it because it would force us to take action. In this case, the key will be for policymakers to pursue the structural reforms that they have long promised while replacing finger-pointing and antagonism with a sensible and respectful global dialogue. The alternative may well be global conflagration.

### 1NC---OFF

#### Util Its good ---

#### 1] Effective debate necessitates primary focus on material violence— anything else ignores oppression.

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Despite the pronouncement of debate as an activity and intellectual exercise pointing to the real-world consequences of dialogue, thinking, and (personal) politics when addressing issues of racism, sexism, economic disparity, global conflicts, and death, many of the discussions concerning these ongoing challenges to humanity are fixed to a paradigm which sees the adjudication of material disparities and sociological realities as the conquest of one ideal theory over the other. In “Ideal Theory as Ideology,” Charles Mills outlines the problem contemporary theoretical-performance styles in policy debate and value-weighing in Lincoln-Douglass are confronted with in their attempts to get at the concrete problems in our societies. At the outset, Mills concedes that “ideal theory applies to moral theory as a whole (at least to normative ethics as against metaethics); [s]ince ethics deals by definition with normative/prescriptive/evaluative issues, [it is set] against factual/descriptive issues.” At the most general level, the conceptual chasm between what emerges as actual problems in the world (e.g.: racism, sexism, poverty, disease, etc.) and how we frame such problems theoretically—the assumptions and shared ideologies we depend upon for our problems to be heard and accepted as a worthy “problem” by an audience—is the most obvious call for an anti-ethical paradigm, since such a paradigm insists on the actual as the basis of what can be considered normatively. Mills, however, describes this chasm as a problem of an ideal-as-descriptive model which argues that for any actual-empirical-observable social phenomenon (P), an ideal of (P) is necessarily a representation of that phenomenon. In the idealization of a social phenomenon (P), one “necessarily has to abstract away from certain features” of (P) that is observed before abstraction occurs. This gap between what is actual (in the world), and what is represented by theories and politics of debaters proposed in rounds threatens any real discussions about the concrete nature of oppression and the racist economic structures which necessitate tangible policies and reorienting changes in our value orientations. As Mills states: “What distinguishes ideal theory is the reliance on idealization to the exclusion, or at least marginalization, of the actual,” so what we are seeking to resolve on the basis of “thought” is in fact incomplete, incorrect, or ultimately irrelevant to the actual problems which our “theories” seek to address. Our attempts to situate social disparity cannot simply appeal to the ontologization of social phenomenon—meaning we cannot suggest that the various complexities of social problems (which are constantly emerging and undisclosed beyond the effects we observe) are totalizable by any one set of theories within an ideological frame be it our most cherished notions of Afro-pessimism, feminism, Marxism, or the like. At best, theoretical endorsements make us aware of sets of actions to address ever developing problems in our empirical world, but even this awareness does not command us to only do X, but rather do X and the other ideas which compliment the material conditions addressed by the action X. As a whole, debate (policy and LD) neglects the need to do X in order to remedy our cast-away-ness among our ideological tendencies and politics.’ How then do we pull ourselves from this seeming ir-recoverability of thought in general and in our endorsement of socially actualizable values like that of the living wage? It is my position that Dr. Martin Luther King Jr.’s thinking about the need for a living wage was a unique, and remains an underappreciated, resource in our attempts to impose value reorientation (be it through critique or normative gestures) upon the actual world. In other words, King aims to reformulate the values which deny the legitimacy of the living wage, and those values predicated on the flawed views of the worker, Blacks, and the colonized (dignity, justice, fairness, rights, etc.) used to currently justify the living wages in under our contemporary moral parameters.

#### 2] Actor spec—

#### a. governments have to aggregate since all collective actions incur tradeoffs that help some and hurt other, means based side constraints freeze action.

#### b. no act omission distinction for governments since policies create permissions and prohibitions so authorizing action cannot be an omission since the state assumes culpability in regulating the public domain, ie voting against something is still acting.

#### c. no intent foresight distinction— governments can’t have intent since they’re made up of multiple actors with separate motivations, ie some congress people might vote for something to gain votes while other actually think the bill is good.

#### Takes out and turns calc indicts, consequentialism might be hard but it’s not impossible, and the alternative is no action which is worse; and actor spec outweighs since different actors have different ethical standings.

#### 3] Substitutability— only consequentialism explains necessary enablers.

Sinnott-Armstrong 92— Walter Sinnott-Armstrong, [Professor of practical ethics] 1992, “An Argument for Consequentialism” Dartmouth College Philosophical Perspectives

A moral reason to do an act is consequential if and only if the reason depends only on the consequences of either doing the act or not doing the act. For example, a moral reason not to hit someone is that this will hurt her or him. A moral reason to turn your car to the left might be that, if you do not do so, you will run over and kill someone. A moral reason to feed a starving child is that the child will lose important mental or physical abilities if you do not feed it. All such reasons are consequential reasons. All other moral reasons are non-consequential. Thus, a moral reason to do an act is non-consequential if and only if the reason depends even partly on some property that the act has independently of its consequences. For example, an act can be a lie regardless of what happens as a result of the lie (since some lies are not believed), and some moral theories claim that that property of being a lie provides amoral reason not to tell a lie regardless of the consequences of this lie. Similarly, the fact that an act fulfills a promise is often seen as a moral reason to do the act, even though the act has that property of fulfilling a promise independently ofits consequences. All such moral reasons are non-consequential. In order to avoid so many negations, I will also call them 'deontological'. This distinction would not make sense if we did not restrict the notion of consequences. If I promise to mow the lawn, then one consequence of my mowing might seem to be that my promise is fulfilled. One way to avoid this problem is to specify that the consequences of an act must be distinct from the act itself. My act of fulfilling my promise and my act of mowing are not distinct, because they are done by the same bodily movements.10 Thus, my fulfilling my promise is not a consequence of my mowing. A consequence of an act need not be later in time than the act, since causation can be simultaneous, but the consequence must at least be different from the act. Even with this clarification, it is still hard to classify some moral reasons as consequential or deontological,11 but I will stick to examples that are clear. In accordance with this distinction between kinds of moral reasons, I can now distinguish different kinds of moral theories. I will say that a moral theory is consequentialist if and only if it implies that all basic moral reasons are consequential. A moral theory is then non-consequentialist or deontological if it includes any basic moral reasons which are not consequential. 5. Against Deontology So defined, the class of deontological moral theories is very large and diverse. This makes it hard to say anything in general about it. Nonetheless, I will argue that no deontological moral theory can explain why moral substitutability holds. My argument applies to all deontological theories because it depends only on what is common to them all, namely, the claim that some basic moral reasons are not consequential. Some deontological theories allow very many weighty moral reasons that are consequential, and these theories might be able to explain why moral substitutability holds for some of their moral reasons: the consequential ones. But even these theories cannot explain why moral substitutability holds for all moral reasons, including the non-consequential reasons that make the theory deontological. The failure of deontological moral theories to explain moral substitutability in the very cases that make them deontological is a reason to reject all deontological moral theories. I cannot discuss every deontological moral theory, so I will discuss only a few paradigm examples and show why they cannot explain moral substitutability. After this, I will argue that similar problems are bound to arise for all other deontological theories by their very nature. The simplest deontological theory is the pluralistic intuitionism of Prichard and Ross. Ross writes that, when someone promises to do something, 'This we consider obligatory in its own nature, just because it is a fulfillment of a promise, and not because of its consequences.'12 Such deontologists claim in effect that, if I promise to mow the grass, there is a moral reason for me to mow the grass, and this moral reason is constituted by the fact that mowing the grass fulfills my promise. This reason exists regardless of the consequences of mowing the grass, even though it might be overridden by certain bad consequences. However, if this is why I have a moral reason to mow the grass, then, even if I cannot mow the grass without starting my mower, and starting the mower would enable me to mow the grass, it still would not follow that I have any moral reason to start my mower, since I did not promise to start my mower, and starting my mower does not fulfill my promise. Thus, a moral theory cannot explain moral substitutability if it claims that properties like this provide moral reasons.

#### 4] Weighability— only consequentialism explains degrees of wrongness— you can only explain why breaking a promise to take a dying person to the hospital is worse than breaking a promise to meet for lunch by appealing to consequences.

#### 5] Use epistemic modesty— that’s the probability of the framework being true times the magnitude of an impact under it.

#### a. substantively true: maximizes the probability of the most moral value; arguments against a framework mitigate offense under it but that mitigation is contingent, half the debate shouldn’t be thrown out just since someone’s 1% ahead on fwk.

#### b. clash: discourages debaters from ignoring contention level debate which means we get education about phil and the topic— topical ed outweighs since we only have 2 months for each topic; this is drop the arg.

## Case

### 1NC---Framing

#### Life and bodily well-being is a pre-requisite and the ultimate condition of non-alienation. The first Jaeggi evidence indicates that people must be free to act how they please --- that is only possible when they are able to act.

#### The second Jaeggi evidence:

#### 1 --- The card does not make the argument that the tag makes… the affirmatives framework links to their argument because it starts from the same flawed starting point.

#### 2 --- We control the internal link --- the only reason paternalism, arbitrary punishments, and alienation are bad is because they cause displeasure.

#### 3 --- Winning an extinction impact means the affirmative is more paternalistic --- saying that people should die en masse to secure some form of liberation in a philosophical sense.

#### Third and forth Jaeggi evidence --- life is a prerequisite to forming relations with others --- above.

### 1NC---Contention

1---

On wright

No warrant; workers can be private property owners and any action they take connects them to the material they produce means no alienation

Turn lack of private property is more alienating because there’s a collapse to the public sector which is notoriously bad about creating good accessibility

On Holen

This is terminally nonunique space isn’t the new frontier there’s just more resources to be commodified means there’s nothing different between space and oil in the south china sea

The bottom of the card says humans are defined by the ensemble of social relations which menas this card flows neg 1. Space is better for social relations it exands the horizons of humanity and 2. Triggers util calc because it’s the only way to evaluate aggregation which is social relations