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#### First, prefer constitutivism over anything else. Claims can only apply to us due to our status as agents.

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#### Second, all actions taken by an agent are not only in line with reason but also with affect, in response to actions generated by their status as a member of the community with shared roles. This falls in line with the ethical community and mutual recognition.

#### Third, the only way to resolve the evil or harms that maybe presented in society is the ethical community as the ethical community is the only way in which we can recognize and respect the actions and agency of other agents. The ethical community allows us to invalidate evils that affect society. Gobsch ‘14

[Wolfram Gobsch, "The Idea of an Ethical Community: Kant and Hegel on the Necessity of Human Evil and the Love to Overcome It," Philosophical Topics, Vol. 42, No. (2014), p. 177-200.  Gobsch is research assistant at the Chair for Practical Philosophy at Universität Leibzig, studied Philosophy and Logic & Philosophy of Science in Leipzig, St Andrews and Basel, ssistant and senior assistant at the Chair for Theoretical Philosophy at the University of Basel, research stay at the University of Chicago.]rctkitkat

Because the highest good is the complete end of the activity of pure reason, the unconditioned, it is necessarily possible.20 The unity of the highest good is the unity thought in the concept of a human being. It is the unity of reason, as of itself practical, with sensibility. It is the unity of pure reason and free choice, of moral law and maxim, through pure reason alone, unconditioned by anything else. Therefore, the idea of this unity, the idea of the highest good, is none other than the idea of ethical life, the idea of a reality in which the internality that is thought in the idea of the moral law as the principle from consciousness of which alone human beings act, if all goes well, and the relationality that is thought in the idea of the power of free choice in its dependence on sensible matter coincide with necessity, and that is: through pure reason. The idea of the highest good is the idea of ethical life: it is the idea of the actuality of a community constituted by the practical law as not only the principle from consciousness of which alone its constituents act, if all goes well, but in and only in so acting from which alone they are related to one another as persons. To identify the idea of ethical life with the idea of the highest good is to conceive of pure reason as the sole ground of the satisfaction of all the conditions of its actuality, or as Hegel puts it, referring to freedom and self-consciousness, the hallmarks of rational activity: Ethical life is the concept of freedom which has become the existing world and the nature of self-consciousness.21 One of the conditions of the actuality of the idea of ethical life is the very multiplicity of the human beings who constitute an ethical community. Satisfaction of this condition, too, must eventually come to be conceived—not as a brute fact, but—as the work of nothing but pure reason. And this is to say, among other things, that the actuality of an ethical community cannot be explained within the scope of methodological individualism. Ethical life, that is, cannot be explained as the result of a contract, for example.22 This reflects back on the content of the idea of ethical life. To act from one’s consciousness of nothing but the moral law is to act autonomously, it is to give this law to oneself: it is to act in such a way as to therein also constitute and preserve oneself as a being who is acting from nothing but one’s consciousness of this law. So for me to be related to you as one person to another in my acting from such respect for the moral law is for me to give the law to both of us and to therein receive it from you who is equally giving it to both of us. So as members of our ethical community, each of us acts in such a way as to constitute and preserve herself and therein the other as a person who acts from nothing but her consciousness of the moral law. In this sense, an act from respect for the moral law, conceived as the principle of an ethical community, is a joint or general act of the will. So in ethical life, the willing itself is relational.23 In our ethical community, that is, my willing is our willing, only from my perspective, oriented toward you; and your willing is our willing, only from your perspective, oriented toward me.24 And because our willing is our acting from nothing but our consciousness of the moral law, I am, in my willing, conscious of myself as related to you in this manner, and you are, in your willing, conscious of yourself as related to me in this manner: we share the same—relational—self-consciousness. In ethical life, the willing itself is relational in its very internality, in its very character as self-consciousness.25 In ethical life, we are conscious of one another as one at heart: as one in the consciousness of the principle from which we act; we are practically conscious of one another’s hearts. Through this consciousness we constitute a sense of “we” in which “validity for every human being (universitas vel omnitudo distributiva), i.e. communality of insight” and “universal union (omnitudo collectiva)”26 coincide with necessity. This implies that for me to act merely in accordance with the moral law, conceived as the principle of our ethical community, but not from my consciousness of it alone, is to break this law and to therein wrong you. But if I do act from nothing but my consciousness of the moral law, thus conceived, I am moved by reason and, therein, by you. That is to say that ethical life is the activity of unconditionally approving of one another’s individuality in such a way as to therein constitute and preserve one another as engaged in this very activity, and that is: love. It is the rational love we know as אהב) ahābā), ἀγάπη, caritas, and solidarity.27

#### Actor spec fails in context of space

Milligan 16 - Tony Milligan, Department of Theology and Religious Studies, King’s College London in the Book “The Ethics of Space Exploration” pgs 132-133, edited by Schwartz and Milligan, published 2016 “Chapter 9: Space Ethics Without Foundations” [Space and Society, DOI 10.1007/978-3-319-39827-3] Accessed 12/14/21 SAO

If the truth of claims about ethics (including space ethics) is in some way bound up with how authoritative agents might respond, what follows? Well, at least a certain difficulty. Whereas we ordinarily have a good grasp of who might be an authoritative agent with regard to terrestrial matters, and how such agents might see, and respond to, particular actions and events, we have very little grasp of who might count as an authoritative agent in the context of distant space settlements with a range of vulnerabilities and psychological pressures that we simply cannot appreciate. Understanding what it is to be such an agent is very different from understanding a science-fiction film. Beyond accepting various important platitudes about murder, rape and cruelty (a good number of which any livable ethic would have to satisfy) we simply have very little idea of how they would see their worlds and respond to them, very little sense of what the best sort of response would involve. What this means is that the content of any account of the foundations of ethics which we could actually specify, and which might be shared between ourselves and such future agents, would have to be exceptionally thin. It would have to be a list of platitudes in the strict sense, i.e. claims of such an extremely general sort that we are all likely to affirm (and which might establish minimal adequacy conditions for a plausible ethic) but from which very little can actually be deduced. Platitudes of this sort can be very useful. We probably cannot do without them. They may certainly help us to tell if we are on roughly the right track, but they may not do much more than this sort of odd-job. As foundations in the initially specified sense of being both stable (in terms of truth or even assertability by authoritative agents at all times and in all places) and also salient to the deduction of detailed ethical judgements when considered in conjunction with various more local items of knowledge, they will simply be unfit for the task. Stability they might achieve but not stability and deductive salience. Indeed, the former will arguably be secured only at the expense of the latter. The more general they are the more stable they will be, but also the less informative. If this is right then something noteworthy follows about the proper scope of space ethics. Arguably, it has an important role in shaping our deliberations in near and medium-term contexts, the requirements of justice within the latter, what would constitute a sustainable program of activities in space and the rudimentary shape of an appropriate contemporary attitude towards space as the next frontier. This will probably cover us adequately for discussions about the ethics of early settlement but not far beyond it. At some point the frontier simply turns into more of an event horizon. Or, at least, it is not obvious that space ethics is going to be the most illuminating sort of discourse that we can currently bring to bear upon matters in the more distant future. When we attempt to stretch the discourse beyond such bounds it may remain edifying but it will begin to resemble a form of science fiction or perhaps even to constitute a form of the latter. We might also expect it to win fewer awards. (Kim Stanley Robinson and Stephen Baxter need not feel threatened.) In any case, the line between the two will become blurred and it will do so for a good reason. This is not necessarily a bad thing, but it does mean that the reliability of familiar sorts of ethical deliberation in such contexts will either be compromised or else they will function as a coded way of commenting upon the present or at least upon more proximate matters. (About which something more reliable can be said.) Here, I am drawn to think of my own faltering attempts to make sense of the ethics of life on a multigenerational ship, en route to some other star system, and how indispensable it was to couch the discussion in terms of various classic science fiction treatments of the scenario rather than to build it out of fundamental principles (Milligan 2015a, pp. 134–51). To be sure, something useful can be said in such discussions, but anything deep that is said may turn out to concern our current predicament or what it is to be human rather than space exploration as such. And this is slightly paradoxical because it means that the further we try to reach into a human future in space and understand the ethics of such a future, the more we are thrown back upon what is familiar, proximate and deep. The danger then is one of imagining that we can specify, by appeal to known and homely considerations, more than the very broadest and most general ethical features of how this more distant and troubling future might be lived.

#### Util devolves because under utilitarianism, the protection of a virtuous life is also calculated – ie someone dying is considered but also someone suffering is considered. The right to life in some form of way is protected under our standard.

#### Hegel offers a rigorous defense of private property rights to allow for freedom , specifically subjective freedom – which is most important. Since space approrpriation requires taking some form of property, we can thus conclude that the appropriation of space for private uses is not unjust. Duncan ‘17

[Duncan, S. (2017). Hegel on Private Property: A Contextual Reading. The Southern Journal of Philosophy, 55(3), 263–284. doi:10.1111/sjp.12238]

According to the developmental thesis, **Hegel also argues for property rights on grounds of a respect for autonomy, but pursues a markedly different strategy.** Instead of arguing that we should respect property rights because property claims represent exercises of autonomy, Hegel argues that property is necessary for developing our capacity for autonomy. Property rights are not a consequence of our capacity for free action, but a precondition for it. In this paper, I challenge the developmental thesis both as a reading of Hegel and a workable defense of private property, and put forward my own interpretation of Hegel’s theory of private property. Hegel does have a novel defense of property rights, but reconstructing it requires that we take a look at the Philosophy of Right as a whole and consider the role of property within the context of the political system that Hegel sketches there rather than merely looking at the Property subsection in isolation, as works that argue for the developmental thesis tend to do. On my interpretation, Hegel defends property rights and the institution of private property on two distinct but related grounds. First, the institution of private property and property rights reflect the respect that individual freedom of choice is due. Contrary to the caricature made popular by Berlin and Popper, Hegel does not simply dismiss such freedom of choice, which he calls subjective freedom, in favor of positive freedom. Instead, he holds that it is valuable and that a truly rational society must respect such subjective freedom. **Recognizing individuals’ rights to private property is a crucially important** aspect of respecting subjective freedom. Part of Hegel’s defense of private property, then, is actually quite similar to the defenses that one finds in Locke, Kant, or even Nozick. What makes Hegel’s defense of private property truly novel, though, is its second aspect. Instead of arguing that subjective freedom should be dismissed in favor of positive freedom, or what Hegel calls substantial freedom, he argues that **property is part of a system that not only respects subjective freedom but also leads individuals to develop their capacities for substantial freedom through the exercise of such negative freedom.** The developmental thesis is partially right in that Hegel does think property is part of a system that leads to the development of our capacities for freedom. However, it is wrong in that it holds that property is necessary for the development of subjective freedom, and by isolating property from the larger system he sketches in the Philosophy of Right, it makes unrealistic claims about how property contributes to such development.

#### Banning private space appropriation inhibits the sale and use of spacecraft and fuel- that’s a form of restricting the free economic choices of individuals

**Richman 12**, Sheldon. “The free market doesn’t need government regulation.” Reason, August 5, 2012. // AHS RG

Order grows from market forces. But where do **market forces** come from? They **are the result of human action. Individuals select ends and act to achieve them by adopting suitable means.** Since means are scarce and ends are abundant, **individuals economize in order to accomplish more rather than less.** And they always seek to exchange lower values for higher values (as they see them) and never the other way around. In a world of scarcity, tradeoffs are unavoidable, so one aims to trade up rather than down. (One’s trading partner does the same.) **The result of this**, along with other **features of human action**, and the world at large **is what we call market forces. But really, it is just men and women acting rationally in the world.**

## 2

#### China’s econ is on the brink of collapse – covid 19 lockdowns, real estate issues, and now the omicron virus is threatening. Government easing back of policy will not help. He 12/21

[Laura He, Cnn Business, 12-15-2021, "China was already facing an economic slowdown in 2022. Now here comes Omicron," CNN, https://www.cnn.com/2021/12/15/economy/china-omicron-economy-intl-hnk/index.html]

Government data released Wednesday showed trouble spots for the world's second largest economy in November. Residential housing prices fell for a third consecutive month, a sign that an ongoing property crisis continues to deepen. Retail sales also struggled, suggesting that coronavirus outbreaks and the government's "zero-Covid" approach of locking down areas where the virus flares up are taking their toll on the economy. Analysts say that **these problems aren't going away**, as new outbreaks force companies to close factories in key manufacturing regions. "A new Covid outbreak in Zhejiang is again triggering local restrictions and factory shutdowns, while troubles in the property sector are likely to hold back property construction for some time," analysts from Capital Economics wrote in a Wednesday note. **Government efforts to ease policies and help the economy "will only cushion the resulting slowdown," they added.** After emerging from 2020 as the only major economy to record growth, China this year has been dealing with a lot of threats to continued expansion. An energy shortage hobbled industrial output for much of this year as the country struggled to balance its need for electricity with efforts to tackle the climate crisis. China's top leaders have already expressed concerns about the prospects for growth. At a key policy meeting last week, they acknowledged that the economy faces "triple pressures: contracting demand, supply shocks and weakening expectations." The world's second biggest economy is still expected to grow by 7.8% in 2021, according to Macquarie Capital. But Larry Hu, chief China economist for Macquarie, warned that the "broad downtrend is set to continue into the new year." While an official GDP target of more than 6% in 2021 was "low hanging fruit," he added, "defending 5% for next year is a hard task." Concerns about growth The data released Wednesday by the National Bureau of Statistics offered little comfort. Along with the flagging real estate and retail figures, investment in fixed assets such as plant and equipment also lost steam. The metric expanded 5.2% through the first 11 months of the year, compared with 6.1% in the first 10 months. The slump was mainly attributed to slower spending in real estate and infrastructure. Unemployment also ticked up slightly, to 5%. There was one bright spot. Industrial output in November rose 3.8% from a year ago, a slight increase from October. "The good news is that the production side of the economy shows some signs of stabilization, thanks to the ease of power shortage and the resilient external demand," Hu wrote. But the release of the data coincided with troubling news from Zhejiang province, one of its biggest manufacturing and export hubs. Many factories in the province have suspended operations as local authorities have tightened curbs on movement to stop an outbreak of more than 200 cases from getting worse. 'Zero-Covid' and new outbreaks There also remain questions about the effectiveness of **China's "zero-Covid" approach, which involves aggressively locking down neighborhoods, cities and entire regions in response to just one or two cases. Prior shutdowns in major economic hubs have snarled shipping ports and stunted global supply chains.** The extent to which the outbreak in Zhejiang will hurt manufacturing is not yet clear. But the city of Ningbo, home to one of the world's largest container ports, has tightened entry, raising concerns about disruptions. **"Further supply chain disruption is a significant possibility,"** analysts at Capital Economics wrote in a Wednesday research note. Concerns about the Omicron variant of the coronavirus also loom large. This week, China reported two cases of the variant, one in the northern port city of Tianjin and another in southern Guangdong province. At a press conference in Beijing on Wednesday, authorities alluded to the global spread of the variant, surging commodity prices, and broken global supply chains, calling the "international environment" something that has become "more complex and severe." And the recent coronavirus outbreaks in China suggest "rolling restrictions and consumer caution are here to stay for the foreseeable future," the Capital Economics analysts wrote. Property slowdown And longstanding problems real estate continue. Evergrande defaulted on its debt last week, leading Beijing to intervene in an attempt to prevent a disorderly collapse that could wreak havoc on the economy and trigger wider risks for homeowners and the financial system. A slowdown in the property structure crept up as the country tried to rein in debt risks and curb an overly leveraged sector. A regulatory crackdown that started last year, intended to tame excessive borrowing in real estate, has sapped liquidity for the sector and pushed some weak players to the brink of collapse. Along with Evergrande's recent default woes, other developers are in trouble, too. Shares of Shanghai-based Shimao Group have plummeted in Hong Kong this week after a planned sale of assets triggered concerns about the company's financial health.

#### The space race and development of outer space benefits China’s economy and is the only method to do so right now. It will also help re-kick start the dying innovation, and China shows interest. Qian and Liu ‘20

[https://research.nus.edu.sg/eai/wp-content/uploads/sites/2/2021/08/EAIBB-No.-1571-Chinas-space-industry-2.pdf]

Space is one of the significant dimensions of the US-China technology competition. In June 2020, China launched the final satellite to complete its Beidou Positioning and Navigation System (BDS), an alternative to the US government-owned Global Positioning System (GPS).1 China, following the United States, has begun to explore Mars. In July 2020, a Long March 5 rocket launched the Tianwen-1 orbiter for Mars exploration.2 1.2 As an indicator of international status, space technology has become a factor in shaping world space competition, 3 with the United States, Russia and China competing for a dominant position in the first echelon of space exploration and the European Union, Japan, India and Brazil competing in the second echelon; the third echelon incorporates other countries with independent satellite launching capabilities, including Israel, Iran, North Korea, South Korea, South Africa and Pakistan.4Generally, **the space industry’s development has military and economic ramifications, benefitting many sectors of the economy and society.**5 A **recent OECD research listed overall gross domestic product (GDP) growth, environmental management, transport and urban planning, research and development and science, climate monitoring and meteorology as the industry’s beneficiaries**.6 1.4 The **benefits also include productivity and efficiency gains and cost saving at the firm level, human capital accumulation for workers, and improved coordination and co-operation at the organisation level**.7 1.5 Ten years ago, only around 50 countries had enough funds for developing the space industry, 8 while in 2018, Greece, Australia, Zimbabwe, Turkey and Luxembourg, for example had newly established space agencies, an indication of the recognition of aerospace’s critical role in supporting national socio-economic, strategic and technological development. 1.6 In 2018, the total global government aerospace budget reached US$70.9 billion, at a compound annual growth rate of 5.75% in the past five years. 9 Countries investing in aerospace continues to increase, registering 88 countries with aerospace budgets, a record high. 1.7 The United States is planning to hold its leadership position in the space industry. In March 2018, the Trump administration promulgated the National Space Strategy. The strategy highlights the “America First” principle and emphasises America’s leading position in space. To implement Trump’s space strategy, the United States reetablished the National Space Council (NSC), set up the Space Development Agency (SDA), a space combat force and the US Space Command (USSPACECOM), 10 which has the potential of almost reshaping the entire space. 1.8 Since the strategy was announced, it has brought responses from many major powers. Russia, Germany, France, Canada, Japan, and South Korea have also formulated or issued space strategies, guidelines, frameworks, basic laws and plans. France approved the establishment of a space commander, while Japan proposed establishing a space security force and India set up the National Defence and Space Agency to improve its space capabilities and protect the security of its own space assets. 1.9 Russia is deepening aerospace industry management reform and stimulating aerospace vitality through various measures such as formulating laws and regulations, increasing skilled human resources, and optimising financial management.11 1.10 The United States’ “National Defence Authorisation Act for Fiscal Year 2020” officially came into effect, authorising the formation of a space army under the Air Force and building the sixth service of the US military; the Department of Defence issued the “Indo-Pacific Strategic Report”, clarifying US strategic plan in the AsiaPacific region. 1.11 The report’s basic proposition is a cooperation between the National Aeronautics and Space Administration (NASA) and other parties in commercial space programmes, a military-civilian integration with particular emphasis on maintaining the superiority of American companies in the space industry The role of the private sector has been highlighted. The main strategies include encouraging space marketisation; planning a commercial model landing on the moon; allowing private companies to undertake the “International Space Station”; and encouraging public-private partnerships to accelerate the transfer of related technologies from NASA and the military to private enterprises.12 1.13 In 2017, the NASA Transition and Authorisation Act left low Earth orbit (between 160km and 2,000km of altitude) to commercial providers and this opened a huge opportunity to the private sector. US private companies such as SpaceX have managed to launch rockets to deploy hundreds of satellites in low Earth orbit (e.g. “Starlink” developed by SpaceX, Orbcomm under Amazon).13 China’s Response to the Global Space Competition 2.1 Like the United States, China has started to leverage on the private sector to initiate commercial space programmes since 2014. Commercial space programmes are expected to channel more resources to the space industry and, more importantly, to promote innovation and enhance efficiency. 2.2 Similar to leading countries in the sector, China has a long history in space exploration. It launched its first satellite with the Long March rocket in 1970. 14 In the 1980s, the development of space programmes was included in the National High-Tech R&D programme (“863” programme) in response to the Star War programme initiated by the United States. In 2003, China's human space programmes bore fruit when it launched Shenzhou 5 spacecraft, sending her first human traveller to space.16 China also sent its Chang’e Three lander making the first soft landing on the moon in December 2013.17 2.4 China led the world in terms of orbital launches (35) in 201818 and in 2019 (34).19 As of 31 March 2020, China (363) ranked second in the world after the United States (1,327) in terms of the total number of operating satellites. 20 2.5 The Long March rockets completed 300 launches by 2019. It took 37 years for Long March rockets to complete the first 100xs launches, while it only took four years to complete its final 100 launches.21 2.6 As indicated in the report of the 19th National Congress of the Communist Party of **China, China set the strategic goal of becoming a space power and elevated this as one of the major national strategies.** 2.7 In recent years, China has continued to promote its objective of becoming a space power, promulgated several policies and regulations to encourage the development of commercial launch vehicles, promoted the application of civilian remote sensing data, and deepened the integration of Beidou navigation, satellite communications and digital transportation, ports and civil aviation.

#### Chinese economic collapse affects all countries. Graceffo 12/21

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**If the Chinese economy falters, it will affect all of its significant trading partners, which basically means the entire world.** Countries around the globe will suffer from slower and more expensive exports as well as reduced demand for imports. Companies in China are suffering from supply chain disruption, higher input costs, pollution curbs, and logistical issues due to pandemic measures, such as fuel rationing, electricity rationing, and disruption at ports. Factory-gate prices, the price of products at the factory, have been steadily rising. All of these circumstances have driven factory inflation to its highest level in 13 years. Construction has reduced and the economy is sluggish. Factory outputs, once the drivers of the Chinese economy, have slowed. Imports of steel are down. Coal imports were down in October compared to September. Sellers of energy and coal, such as Mongolia or Russia, and raw material and mineral exporters in Africa and other developing parts of the world could suffer from a reduction in new construction in China. **Companies heavily invested in China will also suffer. Additionally, U.S. pension funds, individuals, and institutional investors will suffer as they are invested in the $2.1 trillion dollars of Chinese companies listed on American exchanges.** **Holders of China’s foreign currency debt would also be at risk to the tune of $2.4 trillion.** **Developing countries, dependent on the completion of infrastructure projects through China’s Belt and Road Initiative, could be left with unfinished building sites, highways, and power-generation plants that prove to be both expensive and useless. Currently, Belt and Road projects are valued at over $1 trillion across 139 countries around the globe. In short, everyone, from the most to the least developed nations, could be impacted by a collapse of the Chinese economy.** Bad Debts In June of 2021, China’s second largest real-estate developer, Evergrande, failed to pay a short-term debt and the Chinese government froze the company’s bank accounts. The story dominated headlines for months with concerns that if the company defaulted on its $305 billion in liabilities, the fallout could not only drive down the Chinese economy but also possibly impact the global economy. In October another Chinese developer, Fantasia Holdings Group, missed its repayment of $206 million in five-year dollar bonds. Later the same month, China Properties Group’s subsidiary Cheergain Group defaulted on $226 million worth of debt payments. Almost at the same time, another developer, Modern Land China, missed its payment of principal or interest on a $250 million bond. The most recent addition to the default club is homebuilder Sinic Holdings, which also defaulted on $250 million. Yet another Chinese developer, Kaisa Group Holdings, is in danger of missing its debt payments. The company was valued at about $1 billion, but saw its share price drop by 15 percent when the possible default was announced. These cases were highly publicized but they are a bit of a red herring, as the true levels of China’s debt go far beyond the real-estate sector. At the end of 2020, China’s foreign debt, including U.S. dollar debt, stood at roughly $2.4 trillion. Corporate debt is $27 trillion, while the country’s total public debt exceeds 300 percent of GDP. China’s public debt is already 60 percent higher than the average across other countries, and the debt-to-GDP ratio is growing at a rate of about 11 percent per year. As China’s GDP has grown by less than 11 percent annually for the past 11 years, its debt is outpacing its GDP growth. Most commercial banks in China are state-owned, and as such often make decisions based on government edict rather than economic pragmatism. This includes loaning money to state-owned, state-controlled, or state-favored companies and industries in spite of the risk that the money may not be repaid. Consequently, bad loans at Chinese banks hit $540.79 billion in 2020. Chinese banks are also holding a class of non-performing loans in danger of default, which in China are called “special mention loans,” totaling $990.22 billion. But the real number of potentially distressed loans is even higher. Pandemic rules last year permitted many businesses to delay repayment of principal and interest, but the loans remained on the books as “normal.” Many of these loans could slip into default once their payments are scheduled to restart, but for now there is no indication on the books which of them may or may not be in distress. Some non-performing loans may be “hidden” by moving them off the balance sheets of banks and on to the balance sheets of entities specifically created to absorb non-performing loans. Distressed or potentially distressed loans may also be undercounted due to the way in which China classifies non-performing loans, which differs from that in the United States. Many of the “normal” loans in China would qualify as non-performing in the United States, where loans would be considered non-performing loans if they are non-accrual loans, as well as loans which are 90 days past due but still accruing interest. This is a much stricter definition of non-performing loans, as China has five classes of problem loans. On the balance sheets of Chinese banks, loans may be carried as “special mention” rather than non-performing loans, even though the risk of default is extremely high. In many cases, the loans are secured by inflated real-estate holdings, and loans are considered normal by banks even if the company that took the loan is in financial trouble. To get non-performing loans off a bank’s balance sheets, they are often bundled and sold to investors. So the number of non-performing loans that would be on the balance sheet if not for these sales is much higher. For investors, the price of these bundles of non-performing loans is dependent on the statistical probability that the loans will be repaid. By obscuring the repayment risk, the bundle can be sold at a higher price. Researchers estimate that over 70 percent of non-performing-loan bundles were resold at inflated prices. Additionally, given the way in which the bundles are structured, the bank may still be the ultimate guarantor even though the loans are no longer on its balance sheet. Consequently, Chinese banks’ actual exposure to non-performing-loans could be much higher than reported. A proxy measure for the health of bank loans would be to compare the amount of loans the banks made to the income they earned from those loans. Banks in China have seen diminishing income from loans, which suggests that non-performing loans are higher than reported figures. This fact is often obscured by Chinese banks posting high profits, but profits are somewhat subjective and bad loans moved off the balance sheet may not count in the revenue minus costs calculation. But the volume of interest income compared to the volume of loans made is a purely objective indicator, and one that suggests that Chinese banks are not doing as well as they appear to be. From Bad to Murky A related, overlapping source of debt is the so-called shadow banking industry, lending that occurs through non-traditional financial institutions. The shadow banking sector as a whole was estimated to have a total value of about $13 trillion dollars in 2020. **More murky debt can be found in the wealth management product market, totaling $1 trillion**. Wealth management products are sold by banks as low-risk, high-yield investments, much of the proceeds of which are used to fund the property industry. Similar to what happened in the U.S. mortgage crisis, the government imposes strict rules on what quality of debt can be included in these products, but banks have found ways to bundle substandard debt and sell it at higher prices. Local government debt is another cause for concern. As part of China’s development plans over the past decades, the central government has pressured local governments to increase economic growth through infrastructure spending, funded through local government financing vehicles. At the close of last year, China’s local government debt officially stood at $3.97 trillion. Once again, however, experts believe the real number is much higher. In addition to known debt there is “hidden debt,” which comes from local governments standing as guarantors for other entities that borrowed money. Off-balance-sheet borrowing is done through so-called local government funding vehicles, which are formed for the sole purpose of borrowing money that is then invested in local infrastructure development. Consequently, the debt is not carried on the books of the local government, but rather on the books of the local government financing vehicles, although the local government is actually liable for the loans. The debt value of these local government financing vehicles has nearly tripled over the past eight years. According to a Goldman Sachs estimate, “hidden debt” could be as high as $8.2 trillion, just about half of China’s GDP. **Local governments have been issuing bonds in record numbers. They had a quota of $3.75 trillion in 2021 but the central government, in an attempt to reduce debt, has cut the quota to $3.65 trillion. However, even a reduction in bond quotas is still piling debt on top of debt. 60 percent of the proceeds from these bonds have not been used for infrastructure investment, but rather to repay maturing debt.** About a third of local government income is generated by selling land to property developers. This puts local governments, the developers themselves, and the banks in a position of bias toward making more loans rather than fewer. Banks have been able to grow their on-paper profits by making questionable real-estate loans while rolling bad debts over to the next quarter. Comprehensively measured, the property industry may account for roughly 29 percent of China’s GDP and about 30 percent of all loans at financial institutions. Overseas bond defaults by Chinese companies are increasing, reaching $8.7 billion in 2021, 34 percent of which were bonds from real estate companies. On the domestic front, many Chinese developers are facing liquidity issues, increasing the risk of default, including Evergrande Group, whose $305 billion debt is equal to about two percent of China’s GDP, Fantasia Properties, in danger of defaulting on $4 billion, , and Tahoe, which owes about $6.7 billion. Real-estate sector bond defaults increased 159 percent year-on-year, and there may be more to come. A Paper Tiger? In 2020, in spite of a coronavirus economy, China was reported as the world’s largest recipient of foreign direct investment at $163 billion, although much of this investment came via Hong Kong so this figure may be a bit misleading. The point still stands, however, that China is still one of the world’s preferred destinations for foreign direct investment. And while there has been a general trend of foreign companies leaving China, there are still 175,400 foreign firms registered in the country, trying to capitalize on its 1.4 billion potential customers. In light of the massive debt and bad loans being carried by local banks, it appears that doing business with or in China is becoming riskier. As the economy slows further, and as banks curb their lending, infrastructure investment and new construction projects will grind to a halt. This will drive up unemployment, decreasing demand for everything from building materials to factory inputs to consumer goods and services. Most likely, the Chinese economy will no longer grow at the incredible pace that it has for the past three decades. Apart from destructive control decisions taken by Xi Jinping and the Chinese Communist Party, reduced future growth prospects are the result of the Chinese economy maturing while the population is ageing and the workforce is shrinking. Much of the growth since 2008 has been fueled with debt, a potential pitfall that was tolerated because job creation and increasing living standards were a priority. Now, however, job creation may be less of a driver, making the Chinese Communist Party more willing to curb debt and bring under control those aspects of the economy that were allowed to run wild in the name of greater growth. It is extremely unlikely that the Chinese Communist Party will be able to solve all of these problems or completely turn the economy around. The Chinese economy is too big and too complex to be able to remedy the deeply ingrained issues that have become endemic. To bring the Chinese economy in line with those of Western nations, particularly the United States, the Chinese Communist Party would have to undertake deep, systemic changes that it is unwilling to consider, such as decentralization of control, granting rural land rights, and exposing the economy to risky market forces.

#### Decline cascades – nuclear war

Maavak 21 – Mathew Maavak, 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.

## Case

#### Collision is unlikely – all countries receive collision warnings THREE days ahead AND their evidence doesn’t assume new technology.

**Mosher** **’19** [Dave; September 3rd; Journalist with more than a decade of experience reporting and writing stories about space, science, and technology; Business Insider, “Satellite collisions may trigger a space-junk disaster that could end human access to orbit. Here’s How,” <https://www.usafa.edu/app/uploads/Space_and_Defense_2_3.pdf>; GR]//ww pbj

The Kessler syndrome plays center-stage in the movie "Gravity," in which an accidental space collision endangers a crew aboard a large space station. But Gossner said that type of a runaway space-junk catastrophe is unlikely. "Right now I don't think we're close to that," he said. "I'm not saying we couldn't get there, and I'm not saying we don't need to be smart and manage the problem. But I don't see it ever becoming, anytime soon, an unmanageable problem." There is no current system to remove old satellites or sweep up bits of debris in order to prevent a Kessler event. Instead, space debris is monitored from Earth, and new rules require satellites in low-Earth orbit be deorbited after 25 years so they don't wind up adding more space junk. "Our current plan is to manage the problem and not let it get that far," Gossner said. "I don't think that we're even close to needing to actively remove stuff. There's lots of research being done on that, and maybe some day that will happen, but I think that — at this point, and in my humble opinion — an unnecessary expense." A major part of the effort to prevent a Kessler event is the Space Surveillance Network (SSN). The project, led by the US military, uses 30 different systems around the world to identify, track, and share information about objects in space. Many objects are tracked day and night via a networkof radar observatories around the globe. Optical telescopes on the ground also keep an eye out, but they aren't always run by the government. "The commercial sector is actually putting up lots and lots of telescopes," Gossner said. The government pays for their debris-tracking services. Gossner said one major debris-tracking company is called Exoanalytic. It uses about 150 small telescopes set up around the globe to detect, track, and report space debris to the SSN. Telescopes in space track debris, too. Far less is known about them because they're likely top-secret military satellites. Objects detected by the government and companies get added to a catalog of space debris and checked against the orbits of other known bits of space junk. New orbits are calculated with supercomputers to see if there's a chance of any collisions. Diana McKissock, a flight lead with the US Air Force's 18th Space Control Squadron, helps track space debris for the SSN. She said the surveillance network issues warnings to NASA, satellite companies, and other groups with spacecraft, based on two levels of emergency: basic and advanced. The SSN issues a basic emergency report to the public three days ahead of a 1-in-10,000 chance of a collision. It then provides multiple updates per day until the risk of a collision passes. To qualify for such reporting, a rogue object must come within a certain distance of another object. In low-Earth orbit, that distance must be less than 1 kilometer (0.62 mile); farther out in deep space, where the precision of orbits is less reliable, the distance is less than 5 kilometers (3.1 miles). Advanced emergency reports help satellite providers see possible collisions much more than three days ahead. "In 2017, we provided data for 308,984 events, of which only 655 were emergency-reportable," McKissock told Business Insider in an email. Of those, 579 events were in low-Earth orbit (where it's relatively crowded with satellites).

#### No debris impact at every layer of space

Fange 17 (Daniel von Fange. Web Application Engineer. “Kessler Syndrome is Over Hyped,” *Braino*, 5/21/17, <http://braino.org/essays/kessler_syndrome_is_over_hyped/>) dwc 19)//ww pbj

Kessler Syndrome is overhyped. A chorus of online commenters great any news of upcoming low earth orbit satellites with worry that humanity will to lose access to space. I now think they are wrong. //// What is Kessler Syndrome? Here’s the popular view on Kessler Syndrome. Every once in a while, a piece of junk in space hits a satellite. This single impact destroys the satellite, and breaks off several thousand additional pieces. These new pieces now fly around space looking for other satellites to hit, and so exponentially multiply themselves over time, like a nuclear reaction, until a sphere of man-made debris surrounds the earth, and humanity no longer has access to space nor the benefits of satellites.//// It is a dark picture.//// Is Kessler Syndrome likely to happen? I had to stop everything and spend an afternoon doing back-of-the-napkin math to know how big the threat is. To estimate, we need to know where the stuff in space is, how much mass is there, and how long it would take to deorbit. //// The orbital area around earth can be broken down into four regions. //// Low LEO - Up to about 400km. Things that orbit here burn up in the earth’s atmosphere quickly - between a few months to two years. The space station operates at the high end of this range. It loses about a kilometer of altitude a month and if not pushed higher every few months, would soon burn up. For all practical purposes, Low LEO doesn’t matter for Kessler Syndrome. If Low LEO was ever full of space junk, we’d just wait a year and a half, and the problem would be over.///// High LEO - 400km to 2000km. This where most heavy satellites and most space junk orbits. The air is thin enough here that satellites only go down slowly, and they have a much farther distance to fall. It can take 50 years for stuff here to get down. This is where Kessler Syndrome could be an issue. /// Mid Orbit - GPS satellites and other navigation satellites travel here in lonely, long lives. The volume of space is so huge, and the number of satellites so few, that we don’t need to worry about Kessler here. //// GEO - If you put a satellite far enough out from earth, the speed that the satellite travels around the earth will match the speed of the surface of the earth rotating under it. From the ground, the satellite will appear to hang motionless. Usually the geostationary orbit is used by big weather satellites and big TV broadcasting satellites. (This apparent motionlessness is why satellite TV dishes can be mounted pointing in a fixed direction. You can find approximate south just by looking around at the dishes in your northern hemisphere neighborhood.) For Kessler purposes, GEO orbit is roughly a ring 384,400 km around. However, all the satellites here are moving the same direction at the same speed - debris doesn’t get free velocity from the speed of the satellites. Also, it’s quite expensive to get a satellite here, and so there aren’t many, only about one satellite per 1000km of the ring. Kessler is not a problem here. //// How bad could Kessler Syndrome in High LEO be? Let’s imagine a worst case scenario. //// An evil alien intelligence chops up everything in High LEO, turning it into 1cm cubes of death orbiting at 1000km, spread as evenly across the surface of this sphere as orbital mechanics would allow. Is humanity cut off from space? //// I’m guessing the world has launched about 10,000 tons of satellites total. For guessing purposes, I’ll assume 2,500 tons of satellites and junk currently in High LEO. If satellites are made of aluminum, with a density of 2.70 g/cm3, then that’s 839,985,870 1cm cubes. A sphere for an orbit of 1,000km has a surface area of 682,752,000 square KM. So there would be one cube of junk per .81 square KM. If a rocket traveled through that, its odds of hitting that cube are tiny - less than 1 in 10,000. ////// So even in the worst case, we don’t lose access to space. // Now though you can travel through the debris, you couldn’t keep a satellite alive for long in this orbit of death. Kessler Syndrome at its worst just prevents us from putting satellites in certain orbits. //// In real life, there’s a lot of factors that make Kessler syndrome even less of a problem than our worst case though experiment.//// Debris would be spread over a volume of space, not a single orbital surface, making collisions orders of magnitudes less likely.//// Most impact debris will have a slower orbital velocity than either of its original pieces - this makes it deorbit much sooner.//// Any collision will create large and small objects. Small objects are much more affected by atmospheric drag and deorbit faster, even in a few months from high LEO. Larger objects can be tracked by earth based radar and avoided.//// The planned big new constellations are not in High LEO, but in Low LEO for faster communications with the earth. They aren’t an issue for Kessler.//// Most importantly, all new satellite launches since the 1990’s are required to include a plan to get rid of the satellite at the end of its useful life (usually by deorbiting)//// So the realistic worst case is that insurance premiums on satellites go up a bit. Given the current trend toward much smaller, cheaper micro satellites, this wouldn’t even have a huge effect.

#### Alternative measures solve misclac from satellite takeout

Lambakis 01 (Steven Lambakis is a senior defense analyst at the National Institute for Public Policy and the author of On the Edge of Earth: The Future of American Space Power (University Press of Kentucky, 2001). “Space Weapons: Refuting the Critics” <http://www.hoover.org/publications/policy-review/article/6612>, Donnie)//ww pbj

In other words, it is not at all self-evident that a sudden loss of a communications satellite, for example, would precipitate a wider-scale war or make warfare termination impossible. In the context of U.S.-Russian relations, communications systems to command authorities and forces are redundant. Urgent communications may be routed through land lines or the airwaves. Other means are also available to perform special reconnaissance missions for monitoring a crisis or compliance with an armistice. While improvements are needed, our ability to know what transpires in space is growing — so we are not always in the dark.

**No ‘space war’ – Insurmountable barriers and everyone has an interest in keeping space peaceful**

**Dobos 19** [(Bohumil Doboš, scholar at the Institute of Political Studies, Faculty of Social Sciences, Charles University in Prague, Czech Republic, and a coordinator of the Geopolitical Studies Research Centre) “Geopolitics of the Outer Space, Chapter 3: Outer Space as a Military-Diplomatic Field,” Pgs. 48-49] TDI

Despite the theorized potential for the achievement of the terrestrial dominance throughout the utilization of the ultimate high ground and the ease of destruction of space-based assets by the potential space weaponry, the utilization of space weapons is with current technology and no effective means to protect them far from fulfilling this potential (Steinberg 2012, p. 255). In current global international political and technological setting, the utility of space weapons is very limited, even if we accept that the ultimate high ground presents the potential to get a decisive tangible military advantage (which is unclear). This stands among the reasons for the lack of their utilization so far. Last but not the least, it must be pointed out that the states also develop passive defense systems designed to protect the satellites on orbit or critical capabilities they provide. These further decrease the utility of space weapons. These systems include larger maneuvering capacities, launching of decoys, preparation of spare satellites that are ready for launch in case of ASAT attack on its twin on orbit, or attempts to decrease the visibility of satellites using paint or materials less visible from radars (Moltz 2014, p. 31). Finally, we must look at the main obstacles of connection of the outer space and warfare. The first set of barriers is comprised of physical obstructions. As has been presented in the previous chapter, the outer space is very challenging domain to operate in. Environmental factors still present the largest threat to any space military capabilities if compared to any man-made threats (Rendleman 2013, p. 79). A following issue that hinders military operations in the outer space is the predictability of orbital movement. If the reconnaissance satellite's orbit is known, the terrestrial actor might attempt to hide some critical capabilities-an option that is countered by new surveillance techniques (spectrometers, etc.) (Norris 2010, p. 196)-but the hide-and-seek game is on. This same principle is, however, in place for any other space asset-any nation with basic tracking capabilities may quickly detect whether the military asset or weapon is located above its territory or on the other side of the planet and thus mitigate the possible strategic impact of space weapons not aiming at mass destruction. Another possibility is to attempt to destroy the weapon in orbit. Given the level of development for the ASAT technology, it seems that they will prevail over any possible weapon system for the time to come. Next issue, directly connected to the first one, is the utilization of weak physical protection of space objects that need to be as light as possible to reach the orbit and to be able to withstand harsh conditions of the domain. This means that their protection against ASAT weapons is very limited, and, whereas some avoidance techniques are being discussed, they are of limited use in case of ASAT attack. We can thus add to the issue of predictability also the issue of easy destructibility of space weapons and other military hardware (Dolman 2005, p. 40; Anantatmula 2013, p. 137; Steinberg 2012, p. 255). Even if the high ground was effectively achieved and other nations could not attack the space assets directly, there is still a need for communication with those assets from Earth. There are also ground facilities that support and control such weapons located on the surface. Electromagnetic communication with satellites might be jammed or hacked and the ground facilities infiltrated or destroyed thus rendering the possible space weapons useless (Klein 2006, p. 105; Rendleman 2013, p. 81). This issue might be overcome by the establishment of a base controlling these assets outside the Earth-on Moon or lunar orbit, at lunar L-points, etc.-but this perspective remains, for now, unrealistic. Furthermore, no contemporary actor will risk full space weaponization in the face of possible competition and the possibility of rendering the outer space useless. No actor is dominant enough to prevent others to challenge any possible attempts to dominate the domain by military means. To quote 2016 Stratfor analysis, "(a) war in space would be devastating to all, and preventing it, rather than finding ways to fight it, will likely remain the goal" (Larnrani 20 16). This stands true unless some space actor finds a utility in disrupting the arena for others.