### 1 - FW

**I value morality.**

**The standard is minimizing material violence. [To clarify I defend utilitarianism].**

**[1] Personal identity reductionism is true – if the hemispheres of my brain were transplanted into 2 different people, neither would be me.**

**Parfit 84.** Derek Parfit 1984, “Reasons and Persons”, Oxford Paperbacks

It is in fact true that one hemisphere is enough. There are many people who have survived, when a stroke or injury puts out of action one of their hemispheres. With his remaining hemisphere, such a person may need to re-learn certain things, such as adult speech, or how to control both hands. But this is possible. In my example I am assuming that, as may be true of certain actual people, both of my hemispheres have the full range of abilities. I could thus survive with either hemisphere, without any need for re-learning.¶ I shall now combine these last two claims. I would survive if my brain was successfully transplanted into my twin's body. And I could survive with only half my brain, the other half having been destroyed. Given these two facts, it seems clear that I would survive if half my brain was successfully transplanted into my twin's body, and the other half was destroyed.¶ What if the other half was not destroyed? This is the case that Wiggins described: that in which a person, like an amoeba, divides.40 To simplify the case, I assume that I am one of three identical triplets. Consider¶ My Division. My body is fatally injured, as are the brains of my two brothers. My brain is divided, and each half is successfully transplanted into the body of one of my brothers. Each of the resulting people believes that he is me, seems to remember living my life, has my character, and is in every other way psychologically continuous with me. And he has a body that is very like mine.¶ This case is likely to remain impossible. Though it is claimed that, in certain people, the two hemispheres may have the same full range of abilities, this claim might be false. I am here assuming that this claim is true when applied to me. I am also assuming that it would be possible to connect a transplanted half-brain with the nerves in its new body. And I am assuming that we could divide, not just the upper hemispheres, but also the lower brain. My first two assumptions may be able to be made true if there is enough progress in neurophysiology. But it seems likely that it would never be possible to divide the lower brain, in a way that did not impair its functioning.¶ Does it matter if, for this reason, this imagined case of complete division will always remain impossible? Given the aims of my discussion, this does not matter. This impossibility is merely technical. The one feature of the case that might be held to be deeply impossible—the division of a person's consciousness into two separate streams—is the feature that has actually happened. It would have been important if this had been impossible, since this might have supported some claim about what we really are. It might have supported the claim that we are indivisible Cartesian Egos. It therefore matters that the division of a person's consciousness is in fact possible. There seems to be no similar connection between a particular view about what we really are and the impossibility of dividing and successfully transplanting the two halves of the lower brain. This impossibility thus provides no ground for refusing to consider the imagined case in which we suppose that this can be done. And considering this case may help us to decide both what we believe ourselves to be, and what in fact we are. As Einstein's example showed, it can be useful to consider impossible thought-experiments.¶ It may help to state, in advance, what I believe this case to show. It provides a further argument against the view that we are separately existing entities. But the main conclusion to be hdrawn is that personal identity is not what matters.¶ It is natural to believe that our identity is what matters. Reconsider the Branch-Line Case, where I have talked to my Replica on Mars, and am about to die. Suppose we believe that I and my Replica are different people. It is then natural to assume that my prospect is almost as bad as ordinary death. In a few days, there will be no one living who will be me. It is natural to assume that this is what matters. In discussing My Division, I shall start by making this assumption.¶ In this case, each half of my brain will be successfully transplanted into the very similar body of one of my two brothers. Both of the resulting people will be fully psychologically continuous with me, as I am now. What happens to me?¶ There are only four possibilities: (1) I do not survive; (2) I survive as one of the two people; (3) I survive as the other; (4) I survive as both.¶ The objection to (1) is this. I would survive if my brain was successfully transplanted. And people have in fact survived with half their brains destroyed. Given these facts, it seems clear that I would survive if half my brain was successfully transplanted, and the other half was destroyed. So how could I fail to survive if the other half was also successfully transplanted? How could a double success be a failure?¶ Consider the next two possibilities. Perhaps one success is the maximum score. Perhaps I shall be one of the two resulting people. The objection here is that, in this case, each half of my brain is exactly similar, and so, to start with, is each resulting person. Given these facts, how can I survive as only one of the two people? What can make me one of them rather than the other?¶ These three possibilities cannot be dismissed as incoherent. We can understand them. But, while we assume that identity is what matters, (1) is not plausible. My Division would not be as bad as death. Nor are (2) and (3) plausible. There remains the fourth possibility: that I survive as both of the resulting people.¶ This possibility might be described in several ways. I might first claim: ‘What we have called “the two resulting people” are not two people. They are one person. I do survive this operation. Its effect is to give me two bodies, and a divided mind.’¶ This claim cannot be dismissed outright. As I argued, we ought to admit as possible that a person could have a divided mind. If this is possible, each half of my divided mind might control its own body. But though this description of the case cannot be rejected as inconceivable, it involves a great distortion in our concept of a person. In my imagined Physics Exam I claimed that this case involved only one person. There were two features of the case that made this plausible. The divided mind was soon reunited, and there was only one body. If a mind was permanently divided, and its halves developed in different ways, it would become less plausible to claim that the case involves only one person. (Remember the actual patient who complained that, when he embraced his wife, his left hand pushed her away.)¶ The case of complete division, where there are also two bodies, seems to be a long way over the borderline. After I have had this operation, the two ‘products’ each have all of the features of a person. They could live at opposite ends of the Earth. Suppose that they have poor memories, and that their appearance changes in different ways. After many years, they might meet again, and fail even to recognise each other. We might have to claim of such a pair, innocently playing tennis: ‘What you see out there is a single person, playing tennis with himself. In each half of his mind he mistakenly believes that he is playing tennis with someone else.’ If we are not yet Reductionists, we believe that there is one true answer to the questionwhether these two tennis-players are a single person. Given what we mean by ‘person’, the answer must be No. It cannot be true that what I believe to be a stranger, standing there behind the net, is in fact another part of myself.

**That justifies util.**

**Gruzalski 86.** Bart Gruzalski 86 [UChicago], “Parfit's Impact on Utilitarianism”, Ethics, Vol. 96, No. 4, July 1986.

Parfit concludes his discussion of distributive moral principles by claiming that, “when we cease to believe that persons are separately existing entities, the Utilitarian view becomes more plausible. Is the gain in plausibility great, or small? My argument leaves this question open” (p. 342). In contrast, I have argued that the Reductionist View strongly supports the utilitarian account of desert and distributive justice. The argument has two aspects. One is the recognition of the utilitarian emphasis on secondary rules, including principles of distributive justice and policies of desert. These rules, principles, and policies are treated within the utilitarian account as if they have self-standing, whereas in fact they are justified on the principle of utility which alone has self-standing within the utilitarian program. The other aspect of the argument involves the recognition that the utilitarian’s dual treatment of secondary principles dovetails with the dual account of the nature of persons on the Reductionist View: persons exist, yet their existence just involves bodies and interrelated mental and physical events, and a complete description of our lives need not claim that persons exist. Furthermore, a body, brain, and interrelated series of mental and physical events are more fundamental and basic than the person whose existence just consists in them, much as the citizens and the territory are more fundamental and basic than the nation whose existence just consists in them. This corresponds precisely with the utilitarian account, for utilitarianism treats persons as fundamental and separate existents, while grounding this treatment on the impersonal elements of pain, suffering, happiness, and contentment. Because util-itarianism accurately reflects in this way the true nature of persons, it is much more plausible than has been previously recognized. In addition, since many of the current competitors to utilitarianism presuppose that the person is separate from the body, brain, and interrelated mental and physical events, it follows that these views err by being too personal and are therefore implausible. It follows that when we cease to believe that persons are separately existing entities, utilitarianism becomes significantly more plausible than any of its person-centered theoretical competitors.

**[2] Actor Spec— States must use util. Any other standard dooms the moral theory**

**Goodin 90.** Robert Goodin 90, [professor of philosophy at the Australian National University college of arts and social sciences], “The Utilitarian Response,” pgs 141-142 //RS

My larger argument turns on the proposition that there is something special about the situation of public officials that makes utilitarianism more probable for them than private individuals. Before proceeding with the large argument, I must therefore say what it is that makes it so special about public officials and their situations that make it both more necessary and more desirable for them to adopt a more credible form of utilitarianism. Consider, first, the argument from necessity. Public officials are obliged to make their choices under uncertainty, and uncertainty of a very special sort at that. All choices – public and private alike – are made under some degree of uncertainty, of course. But in the nature of things, private individuals will usually have more complete information on the peculiarities of their own circumstances and on the ramifications that alternative possible choices might have for them. Public officials, in contrast, are relatively poorly informed as to the effects that their choices will have on individuals, one by one. What they typically do know are generalities: averages and aggregates. They know what will happen most often to most people as a result of their various possible choices, but that is all. That is enough to allow public policy-makers to use the utilitarian calculus – assuming they want to use it at all – to choose general rules or conduct.

**[3] Ethical frameworks must be theoretically legitimate. All frameworks are functionally topicality interpretations of the word ought so they must theoretically justified. Prefer – ground – both debaters are guaranteed access to ground – Aff gets plans and advantages, while Neg gets disads and counterplans. Additionally, anything can function as an impact as long as an external benefit is articulated, so all your offense applies. B] topic lit – most debate education comes from debating the topic, o/w phil edu – we can learn about phil in books but clash is unqiue to debate**

**[4] Pleasure and pain are the starting point for moral reasoning—they’re our most baseline desires and the only things that explain the intrinsic value of objects or actions**

**Moen 16**, Ole Martin (PhD, Research Fellow in Philosophy at University of Oslo). "An Argument for Hedonism." Journal of Value Inquiry 50.2 (2016): 267.

Let us start by observing, empirically, that **a widely shared judgment about intrinsic value** and disvalue **is that pleasure is intrinsically valuable and pain is intrinsically disvaluable**. On virtually any proposed list of intrinsic values and disvalues (we will look at some of them below), pleasure is included among the intrinsic values and pain among the intrinsic disvalues. This inclusion makes intuitive sense, moreover, for **there is something undeniably good about the way pleasure feels and something undeniably bad about the way pain feels**, and neither the goodness of pleasure nor the badness of pain seems to be exhausted by the further effects that these experiences might have. “Pleasure” and “pain” **are** here **understood inclusively**, as encompassing anything hedonically positive and anything hedonically negative. 2 The special value statuses of pleasure and pain are manifested in how we treat these experiences in our everyday reasoning about values. If you tell me that you are heading for the convenience store, **I might ask: “What for**?” This is a reasonable question, for when you go to the convenience store you usually do so, not merely for the sake of going to the convenience store, but for the sake of achieving something further that you deem to be valuable. You might answer, for example: “To buy soda.” This answer makes sense, for soda is a nice thing and you can get it at the convenience store. I might further inquire, however: “What is buying the soda good for?” This further question can also be a reasonable one, for it need not be obvious why you want the soda. You might answer: “Well, I want it for the pleasure of drinking it.” If I then proceed by asking “But what is the pleasure of drinking the soda good for?” the discussion is likely to reach an awkward end. **The reason is that the pleasure is not good for anything further; it is simply that for which going to the convenience store and buying the soda is good**. 3 As Aristotle observes: “**We never ask** [a man] **what** his **end is in being pleased, because we assume that pleasure is choice worthy in itself**.”4 Presumably, a similar story can be told in the case of pains, for if someone says “This is painful!” we never respond by asking: “And why is that a problem?” We take for granted that **if something is painful, we have a sufficient explanation of why it is bad**. If we are onto something in our everyday reasoning about values, it seems that **pleasure and pain are both places where we reach the end of the line in matters of value. Although pleasure and pain thus seem to be good candidates for intrinsic value and disvalue**, several objections have been raised against this suggestion: (1) that pleasure and pain have instrumental but not intrinsic value/disvalue; (2) that pleasure and pain gain their value/disvalue derivatively, in virtue of satisfying/frustrating our desires; (3) that there is a subset of pleasures that are not intrinsically valuable (so-called “evil pleasures”) and a subset of pains that are not intrinsically disvaluable (so-called “noble pains”), and (4) that pain asymbolia, masochism, and practices such as wiggling a loose tooth render it implausible that pain is intrinsically disvaluable. I shall argue that these objections fail. Though it is, of course, an open question whether other objections to P1 might be more successful, I shall assume that if (1)–(4) fail, we are justified in believing that P1 is true itself a paragon of freedom—there will always be some agents able to interfere substantially with one’s choices. The effective level of protection one enjoys, and hence one’s actual degree of freedom, will vary according to multiple factors: how powerful one is, how powerful individuals in one’s vicinity are, how frequent police patrols are, and so on. Now, we saw above that what makes a slave unfree on Pettit’s view is the fact that his master has the power to interfere arbitrarily with his choices; in other words, what makes the slave unfree is the power relation that obtains between his master and him. The difﬁculty is that, in light of the facts I just mentioned, there is no reason to think that this power relation will be unique. A similar relation could obtain between the master and someone other than the slave: absent perfect state control, the master may very well have enough power to interfere in the lives of countless individuals. Yet it would be wrong to infer that these individuals lack freedom in the way the slave does; if they lack anything, it seems to be security. A problematic power relation can also obtain between the slave and someone other than the master, since there may be citizens who are more powerful than the master and who can therefore interfere with the slave’s choices at their discretion. Once again, it would be wrong to infer that these individuals make the slave unfree in the same way that the master does. Something appears to be missing from Pettit’s view. If I live in a particularly nasty part of town, then it may turn out that, when all the relevant factors are taken into account, I am just as vulnerable to outside interference as are the slaves in the royal palace, yet it does not follow that our conditions are equivalent from the point of view of freedom. As a matter of fact, we may be equally vulnerable to outside interference, but as a matter of right, our standings could not be more different. I have legal recourse against anyone who interferes with my freedom; the recourse may not be very effective—presumably it is not, if my overall vulnerability to outside interference is comparable to that of a slave— but I still have full legal standing.68 By contrast, the slave lacks legal recourse against the interventions of one speciﬁc individual: his master. It is that fact, on a Kantian view—a fact about the legal relation in which a slave stands to his master—that sets slaves apart from freemen. The point may appear trivial, but it does get something right: whereas one cannot identify a power relation that obtains uniquely between a slave and his master, the legal relation between them is undeniably unique. A master’s right to interfere with respect to his slave does not extend to freemen, regardless of how vulnerable they might be as a matter of fact, and citizens other than the master do not have the right to order the slave around, regardless of how powerful they might be. This suggests that Kant is correct in thinking that the ideal of freedom is essentially linked to a person’s having full legal standing. More speciﬁcally, he is correct in holding that the importance of rights is not exhausted by their contribution to the level of protection that an individual enjoys, as it must be on an instrumental view like Pettit’s. Although it does matter that rights be enforced with reasonable effectiveness, the sheer fact that one has adequate legal rights is essential to one’s standing as a free citizen. In this respect, Kant stays faithful to the idea that freedom is primarily a matter of standing—a standing that the freeman has and that the slave lacks. Pettit himself frequently insists on the idea, but he fails to do it justice when he claims that freedom is simply a matter of being adequately (and reliably) shielded against the strength of others. As Kant recognizes, the standing of a free citizen is a more complex matter than that. One could perhaps worry that the idea of legal standing is something of a red herring here—that it must ultimately be reducible to a complex network of power relations and, hence, that the position I attribute to Kant differs only nominally from Pettit’s. That seems to me doubtful. Viewing legal standing as essential to freedom makes sense only if our conception of the former includes conceptions of what constitutes a fully adequate scheme of legal rights, appropriate legal recourse, justiﬁed punishment, and so on. Only if one believes that these notions all boil down to power relations will Kant’s position appear similar to Pettit’s. On any other view—and certainly that includes most views recently defended by philosophers—the notion of legal standing will outstrip the power relations that ground Pettit’s theory.

**[5] Util is a lexical pre-requisite to any other framework-threats to bodily security and life preclude the ability for moral actors to effectively utilize and act upon other moral theories since they are in a constant state of crisis that inhibit the ideal moral conditions which other theories presuppose – so, util comes first and my offense outweighs theirs under their own framework.**

**[6] No intent-foresight distinction — if we foresee a consequence, then it becomes part of our deliberation which makes it intrinsic to our action since we intend it to happen.**

**[7] Only consequentialism explains degrees of wrongness—if I break a promise to meet up for lunch, that is not as bad as breaking a promise to take a dying person to the hospital. Only the consequences of breaking the promise explain why the second one is much worse than the first.**

**[8] No act-omission distinction – We are responsible for intentional omissions because we actively choose not to act—we intend and act upon omissions.**

**[12] Extinction First –**

**[a] Forecloses future improvement – we can never improve society because our impact is irreversible**

**[b] Turns suffering – mass death causes suffering because people can’t get access to resources and basic necessities**

**[c] Moral uncertainty – if we’re unsure about which interpretation of the world is true – we ought to preserve the world to keep debating about it**

### 1NC - DA

#### The Space Economy is rapidly growing – all thanks goes to the private sector

Rana and Sharma 21 [ Damini Rana works at Delhi Public School RK Puram, Delhi, India and Mritunjay Sharma is an Advisor. JSR Volume 10 Issue 3 2021 “The New Final Frontier: A Case Study Analysis of Private Sector’s Increasing Role in the Space Industry” https://www.jsr.org/hs/index.php/path/article/view/1622 ] //aaditg

This has drawn tremendous interest from both entrepreneurs and investors, as space became not just an exciting, but also a lucrative, investment. Figure 4 shows how SpaceX’s success has since sparked a rapid increase in private investments in space. From less than US$500 million per year in 2009, private investment in space had grown to over US$5 billion per annum by 2019. [32]. Fig. 4. Cumulative private investments. The next section offers an analysis of how the space economy is expected to grow in the future and the role that private investment will continue to play in it. Future Outlook of Space Revenues and Investments The analysis and research provided above clearly indicates that the commercial sector has a much higher impact on the monetary size of the space economy than the government sector. While the government may have started space research, the growth of the space economy is now driven primarily by private sector initiatives. The space economy’s growth looks promising over the next decades, as humans look to leverage the earthoriented opportunities (communications, earth observation, etc.) in the near term and the prospects of mining, space tourism, as well as Moon & Mars expeditions in future. Several organizations have made forecasts of the space economy using slightly different starting points and future assumptions. The Science & Technology Policy Institute [17] has collated and reviewed some of these forecasts, as provided in Table 4 below. According to its report published in 2017, Morgan Stanley estimates that the global space industry could generate more than US$1 trillion in revenue by 2040 [33]. As per the report, the industry growth in the next 5-7 years is likely to be driven by the launches of LEO satellite constellations and their associated services, while growth after 2026, to a substantial extent, will be determined by what are mentioned as ‘second order impacts’ in the report – essentially this will require the New Space Economy businesses to start pulling their weight from a commercial perspective. Fig. 5. The global space economy (US$ million). It is evident that while the near-term opportunities are satellite-led and relatively well-established, new space opportunities, that is, asteroid mining, space tourism and the colonization of Mars, are novel and riskier, in terms of both economic value and timelines. Significant investments will be required before some of these are realized. Keeping this in view, a forecast was made for space industry revenues till 2040. Investments required to achieve these revenues were also assessed through quantitative regression analysis. A. Space Economy Forecast Till 2040 The historical data for space economy size used earlier in Table 1 was projected forward to forecast the size of the economy till 2040. As per Table 1, the space economy grew at 6.5% from 2005-2019, with the commercial economy growing at 7.3% and the government at 3.9%. Significant recent growth can be attributed to the need for more satellites by a rapidly digitizing world. This is a relatively low-hanging fruit for private sector exploitation. However, it is expected that with increasing scale and greater technical challenges to be overcome in non-satellite business, the growth over the next two decades may be lower than what has been witnessed over the last decade. Hence, the following assumptions have been made for the forecast. Annual growth rate of Commercial Economy: 6.5% Volume 10 Issue 3 (2021) ISSN: 2167-1907 www.JSR.org 11 Annual growth rate of Government Economy: 3% The above assumptions led to a forecast for the space economy as per Table 5 below. The above forecast suggests that the space economy will grow from US$424 billion in 2019 to US$1.4 trillion by 2040, at an annualized rate of about 6%. The size of the commercial economy by 2040 will be US$1.26 trillion, while the government economy will be US$162 billion. This indicates that the share of the government economy in the total space economy would decline from 20.5% in 2019 to 11.3% in 2040.

#### Private Space Exploration *solves* recession

Sidorov 20 [ Konstantin Sidorov is chief executive of the London Tech Club. City AM “Need a way out of recession? Look to the stars” <https://www.cityam.com/need-a-way-out-of-recession-look-to-the-stars/> 11/23/2020] //aaditg

“We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard; because that goal will serve to organize and measure the best of our energies and skills.” These words by President John F. Kennedy are as important today as they were when he spoke in 1962. Asteroid mining may seem like something out of a sci-fi movie, and not the most obvious choice of investment, especially during a global pandemic and recession. But it is exactly these kinds of aspirations that have pushed human endeavour and technological advancement to new heights. The discoveries made along the way to achieving these sky-high goals have become integral parts of our daily lives — and could even help us out of this recession. The economics of space is now a crucial part of the market and no longer only in the realm of government endeavour. Private capital is paving the way for public partnerships. Supply chains in the “new space economy” are accelerating, startups are emerging, and clusters are forming. Old space discovery was defined by the Russian Voshod and Vostok and the US Apollo missions. We have entered a space age defined by private enterprise. Financial firms Goldman Sachs, Morgan Stanley and Bank of America Merrill Lynch have each conducted their own studies and found the space economy could reach between $1 trillion and $2.7 trillion by the 2040s. That would make it larger than the 2017 GDP of the UK. But are these astronomical figures relevant to people beyond the likes of Elon Musk, Jeff Bezos and Richard Branson? The answer is a resounding yes. The space sector is made up of a hidden infrastructure which most people do not see but is central to the technology that surrounds us. The strides humankind is making in space are integral to the day-to-day things we take for granted. Space plays an indispensable role in the global economy. The highest grossing sectors — agriculture, mining, transportation, IT, finance, and insurance — all heavily rely on systems and technology developed for space. We know that without satellite observation our navigation and mapping capacity would be significantly reduced. But that is only the start. Satellite data is being harnessed to protect critical infrastructure, and can be used to prevent disasters like the Morandi bridge collapse in Genoa by monitoring and holding critical information to better manage and maintain these types of structures. Given that there are over 80,000 ageing bridges in Canada alone, most with a design life of less than 100 years, the potential impact could be huge. The insurance industry can also be transformed by “mega constellations” — a group of artificial satellites working together as a system to provide permanent global coverage. Insurers are excited about the prospect of increased real-time data on hurricanes, especially the ability to use imagery and analytics to speed up or question claims. Amazon is rolling out plans to launch over 3,200 satellites to over 95 per cent of the Earth’s surface. The initiative is to launch a constellation of low Earth orbit satellites that will provide low-latency, high-speed broadband connectivity to the unserved communities around the world. Starlink, built by SpaceX, is launching “constellation broadband” to deliver higher-speed internet connections across the world. The volume of space spin-off industries is multiplying every year. NASA has created more than 2,000 inventions that later became widespread products and services. Innovations such as the dialysis machines, CAT scanners and freeze-dried food are all a result of space-related projects. Without investment in space exploration we would be without memory foam or GPS, while an adaptation of the spacesuit upgrade led to the creation of the Nike Air footwear. We are only going to become more dependent on space technologies as AI and the fourth industrial revolution take off. Satellite data and its deep-learning technology are being used to map and monitor solar energy assets for smart city and smart grid initiatives. The AI combines satellite data with other factors such as weather information and local government policies to provide a complete picture of the emissions and financial benefits the technology could bring. And yet, despite these strides, space exploration is still not considered a central part of our everyday lives. That needs to change. Governments must recognise its strategic importance. Consumers must realise how the space industry affects their everyday actions. Investors must consider the value of investment into the sector. Space is key to protecting our people, promoting our global influence, and providing future prosperity.

#### Recessions cause war – stats support transition wars, resource conflicts, terrorism, and diversionary wars – other authors don’t base their analysis on global studies

Royal ’10 [Jedediah, Director of Cooperative Threat Reduction at the U.S. Department of Defense, “Economic Integration, Economic Signaling and the Problem of Economic Crises”, 2010, Economics of War and Peace: Economic, Legal and Political Perspectives, ed. Goldsmith and Brauer, p. 213-215]PM

Less intuitive is how periods of economic decline may increase the likelihood of external conflict. Political science literature has contributed a moderate degree of attention to the impact of economic decline and the security and defence behaviour of interdependent slates. Research in this vein has been considered at systemic, dyadic and national levels. Several notable contributions follow. First, on the systemic level. Pollins (2008) advances Modelski and Thompson's (19%) work on leadership cycle theory, finding that rhythms in the global economy are associated with the rise and fall of a pre-eminent power and the often-bloody transition from one pre-eminent leader to the next. As such, exogenous shocks such as economic crises could usher in a redistribution of relative power (sec also Gilpin. 1981) that leads to uncertainty about power balances, increasing the risk of miscalculation (Fearon, 1995). Alternatively, even a relatively certain redistribution of power could lead to a permissive environment for conflict as a rising power may seek to challenge a declining power (Werner, 1999). Separately. Pollins (1996) also shows that global economic cycles combined with parallel leadership cycles impact the likelihood of conflict among major, medium and small powers, although he suggests that the causes and connections between global economic conditions and security conditions remain unknown. Second, on a dyadic level. Copeland's (1996. 2000) theory of trade expectations suggests that 'future expectation of trade' is a significant variable in understanding economic conditions and security behaviour of states. He argues that interdependent states are likely to gain pacific benefits from trade so long as they have an optimistic view of future trade relations. However, if the expectations of future trade decline, particularly for difficult to replace items such as energy resources, likelihood for conflict increases. as states will be inclined to use force to gain access to those resources. Crises could potentially be the trigger for decreased trade expectations either on its own or because it triggers protectionist moves by interdependent states.4 Third, others have considered the link between economic decline and external armed conflict at a national level. Blomberg and Hess (2002) find a strong correlation between internal conflict and external conflict, particularly during periods of economic downturn. They write, The linkages between internal and external conflict and prosperity are strong and mutually reinforcing. Economic conflict tends to spawn internal conflict, which in turn returns the favour. Moreover, the presence of a recession lends to amplify the extent to which international and external conflicts self-reinforce each other. (Blomberg & I less. 2002. p. 89) Economic decline has also been linked with an increase in the likelihood of terrorism (Blomberg. Hess. & Wccrapana. 2004). which has the capacity to spill across borders and lead to external tensions. Furthermore, crises generally reduce the popularity of a sitting government. "Diversionary theory' suggests that, when facing unpopularity arising from economic decline, sitting governments have increased incentives to fabricate external military conflicts to create a 'rally around the flag' effect. Wang (1996), DcRoucn (1995), and Blomberg. Mess, and Thacker (2006) find supporting evidence showing that economic decline and use of force are at least indirectly correlated. Gelpi (1997), Miller (1999), and Kisangani and Pickering (2009) suggest that the tendency towards diversionary tactics are greater for democratic states than autocratic states, due to the fact that democratic leaders are generally more susceptible to being removed from office due to lack of domestic support. DcRoucn (2000) has provided evidence showing that periods of weak economic performance in the United States, and thus weak Presidential popularity, are statistically linked to an increase in the use of force. In summary, recent economic scholarship positively correlates economic integration with an increase in the frequency of economic crises, whereas political science scholarship links economic decline with external conflict at systemic, dyadic and national levels.5 This implied connection between integration, crises and armed conflict has not featured prominently in the economic-security debate and deserves more attention. This observation is not contradictory to other perspectives that link economic interdependence with a decrease in the likelihood of external conflict, such as those mentioned in the first paragraph of this chapter. Those studies tend to focus on dyadic interdependence instead of global interdependence and do not specifically consider the occurrence of and conditions created by economic crises. As such, the view presented here should be considered ancillary to those views.

**That causes global nuclear war.**

Merlini ’11 [Cesare, was a nonresident senior fellow at the Center on the United States and Europe and is chairman of the Board of Trustees of the Italian Institute for International Affairs (IAI) in Rome, “A Post-Secular World?”, 03-30-2011, Routledge, https://www.brookings.edu/wp-content/uploads/2016/06/04\_international\_relations\_merlini.pdf]PM

Two neatly opposed scenarios for the future of the world order illustrate the range of possibilities, albeit at the risk of oversimplification. The first scenario entails the premature crumbling of the post-Westphalian system. One or more of the acute tensions apparent today evolves into an open and traditional conflict between states, perhaps even involving the use of nuclear weapons. The crisis might be triggered by a collapse of the global economic and financial system, the vulnerability of which we have just experienced, and the prospect of a second Great Depression, with consequences for peace and democracy similar to those of the first. Whatever the trigger, the unlimited exercise of national sovereignty, exclusive self-interest and rejection of outside interference would likely be amplified, emptying, perhaps entirely, the half-full glass of multilateralism, including the UN and the European Union. Many of the more likely conflicts, such as between Israel and Iran or India and Pakistan, have potential religious dimensions. Short of war, tensions such as those related to immigration might become unbearable. Familiar issues of creed and identity could be exacerbated. One way or another, the secular rational approach would be sidestepped by a return to theocratic absolutes, competing or converging with secular absolutes such as unbridled nationalism.

### UV

#### Grant us new 2NR responses – the entire 1AC is a blip storm which means you should grant us leeway in the 2NR because they’ll just go for a few args in the 1AR and recontextualize them. Also overexplaining in 1NC causes time skew so I need to be able to beat back on that

#### Negating is harder—

#### [1] Speech numbers – you get 3 speeches which lets you first tailor the debate in a way that favors you in the 1AC, whereas the 1NC starts in the dark, and you get last speech to crystallize the debate in a way that helps you, giving you ethos boost – outweighs bc we both have 13 minutes but your distribution controls the internal link to the entire debate and judge decision calculus

#### The affirming harder— we’ll turn both of their args

#### Reject the Shah ev – it’s mis contextualized bc it talks about janfeb and is observational study so it’s prone to confounding variables. Prefer analytics – more contextual to the round and less prone to confounding variables.

#### The B point – turn, that’s a reason negating is harder since we don’t know the aff’s advocacy or framework so have more of a research burden to prep it- also outweighs bc the aff can always leverage 1AC offense, but we can’t

#### The counter role of the ballot is to determine the desirability of a topical affirmative – solves inclusion since any argument can be run, but ours is net better for inclusion bc we include things such as reps Ks that link to the aff. Prefer because it’s grounded in the res, so it serves as the best stasis point for both sides, which means it’s best for equal division of ground and clash. Prefer our definition because it’s the definition of resolved, which is in the resolution and outweighs on constitutivism. Truth testing also collapses to comparative worlds because we know a moral statement is true if the world in which it is enacted is more moral than a world without it so we need some comparison to determine truth

#### No aff 1AR theory or RVIs –

1AR theory is illegit—

A)it skews to aff—forces the 2NR to overcover theory— destroys collapsing and crystallization in the last speech, while the 2AR can sit on one layer, which also justifies 2NR RVIs – there’s no 2NR dump since you have 7 minutes from 1AR and 2AR. Also a reason I get 2NR RVIs

2) Time skew—they get 7 minutes to win the theory debate with the and I only have a 6 minute 2NR – outweighs bc its more structural, whereas both of us have 13 minutes and they get 2 speeches while I get 1. Neg theory comes first because any abusive positions were read as a reaction to the aff’s abusive position—the 1AC’s abuse controls the root cause. No infinite abuse – hard debate is not impossible and is good and that just gives you more leeway

Drop the arg solves – no time skew bc I spent time reading the position and it sets a precedent since I wasted time reading the arg. It’s net better bc it deters friv theory by forcing aff to waste time reading shells and allows return to substance

#### **Reject metatheory – infinite regress bc they could read theory on theory on theory, making the actual abuse irresolvable – controls the internal link to solving abuse bc any engagement is better than no engagement. Metatheory isn’t the highest layer as it begs the question of norm setting and has no terminal impact. We already answered time skew args**

#### Grant us 2NR paradigm issues – otherwise they can make new 1AR paradigm issues that doom 2NR strategy as it’s unpredictable and shuts down all outs bc they can say evaluate the round after the 1AR, granting auto aff win. Outweighs their claims bc obviously I wont spend all 6 minutes on layering and you can beat back in the 2AR with no time skew bc you also had the 1AR. Also key to reciprocity since you get 2 speeches for paradigm issues, so I should also get 2.

#### There are lots of contradictions – drop the debater – cross apply premeditated murder—

#### They say they get RVIs, but I don’t

#### They say we can’t respond to standards in the 2NR, but they can extrapolate in the 1AR and 2AR

#### Say empirics unreliable in the FWK but then say empirics are the best

Permissibility, presumption, and skep negate:

[1] Obligations- the resolution indicates the affirmative has to prove an obligation, and permissibility would deny the existence of an obligation

[2] Falsity- Statements are more often false than true because proving one part of the statement false disproves the entire statement. Presuming all statements are true creates contradictions which would be ethically bankrupt.

[3] Negating is harder

[4] Affirmation theory- Affirming requires unconditionally maintaining an obligation

Affirm: maintain as true.

That’s Dictionary.com- “affirm” <https://www.dictionary.com/browse/affirm>

#### Outweighs on common usage – one of the first dictionaries that comes up

#### The d point – no, we presume things false bc otherwise we would have infinite obligations, freezing action. Also prefer bc statements are more often false than true bc anything else creates contradictions

#### The b point – that’s the definition of permissibility – there is no definite way to reason

#### The c point – we turned it

#### The util indicts—

#### The A point – yes, the judgement serves as a precedent for future similar actions

#### The B point – we look at the brink of consequences in terms of probability. Induction works – even if it isn’t a 100%, it still serves as a method to predict the future – that’s why we depend on it and that’s why it is the probability. The causation argument is wrong – multiple experiences helps us narrow down causes

#### The C point – no, we add up the pain of each event to the point that our body can group it ie we don’t will every nanometer of a step, btu the overall step and aggregate that pain and pleasure to determine if the action is overall pleasurable. Also wills fail to unite action as our identity changes so the will for doing an overall action can’t exist if it is an expression of a different person

#### The D point – obviously we aren’t culpable for everything bc some things have such a low probability of us being responsible for it

#### The E point – every agent is an arbiter since everyone knows pain and pleasure

### Framework

The TJF

On resource inequities util turns – it’s the majority of wiki prep that small schools can scour but kant is an obscure philosophy that requires coaching

On resolvability – how do you weigh 2 perfect duties? Util has metaweighing for diff impacts

#### The A point on naturalistic fallacy – no, we connect experiences to morality based off pain and pleasure so we can still prescribe what ought to be because we give value to pleasure

#### The B point – it’s Nonunique – even reason could be from a simulation or we may be dreaming that there are other agents. Even if we are in a simulation, that just means we derive a moral theory within our setting which would be within the simulation. Also people do experience the same – that’s why pain is always bad and pleasure is good

#### The C point –

#### [1] Group this with other args on why reason is a constraint or hijack -fallacy of origin – just because reason is constitutive of authority does not mean it’s the starting point of theory ie just because oxygen is constitutive of survival does not make it the basis of moral theory

#### [2] we hijack bindingness – there’s no terminal impact ot not acting off reason, but only pain is binding because we physically cannot keep our hand on a stove

#### [3] conflates reason – reasoning on why does not equate to universalizing maxims

#### [4] it’s empirical – just because questioning authority over reason now does not mean it will always concede reason

#### [6] no bindingness – no one else knows my intent, so I can just say me stealing was an accident, which means there’s no moral culpability, justifying any atrocity Only util solves since we are responsible for consequences

#### The universality arg—

#### [1] shmagency objection – begs the question of why it matters that I want to be an agent – there’s no external impact so it doesn’t matter

#### [2] Parfit takes out – if personal identity does not exist that means I could not prescribe an action as being an extension of myself, so there would be no need to universalize

#### [3] Begs the question of others also acting in the same way, which literally never happens, so there’s no link and there’s no bindingness

#### [4] begs the question of how an action can impede on other’s ends ie maybe if I get the last ice cream, it may be the last one and others may want it or have another consequential outcome, which means the framework is empirical and undermines itself

#### [5] ought-ought gap – no link between practical reason existing and maxims needing to be universalizable

#### [6] util hijacks – begs the question of why it matters that autonomy is decreased, which only util can explain bc it inhibits how we can reach happiness

#### No side constraint – cross apply fallacy of origin and lexical pre-req controls the internal link to freedom bc you need to be alive to set and pursue ends

#### The Performativity arg – no, in util you can make decisions for others and it’s fallacy of origin, just because it’s necessary is not a reason to maximize freedom

#### The Impact calc a point – no act omission distinction – states are still culpable for not acting, for example if they have the choice to provide aid to Yemen, its bad for them to not. This doesn’t mean infinite obligations because obviously a person can’t be 100% moral, but they should strive for it. Anything else means there is no motivation to resolve things such as racism destroying bindingness

#### The blippy weighing arg – no warrant for why that means there’s further assessment bc we use experiences to calculate

#### The affirmation a priori – no, obviously if it’s the same resolution, negating would be the opposite of affirming because that proves the resolution can’t be true. Also destroys resolvability bc you would never evaluate the debate, destroying clash and outweighs bc without resolvability you couldn’t even resolve their arg

#### The obligations a priori – no, if we prove that you should morally negate, that would mean negating is the greatest obligation so it would outweigh your obligation – even if there are multiple obligations, decisions are made by erring on the largest obligation

#### The C point – yes we can contest. Turn reciprocity – it’s key because you can do the same – contest my framework and my advantage. Also key to clash – allows for contestation on multiple layers so we can understand the depth of philosophies both in their relation in others and impact calc – clash outweighs only thing unique to debate. Reciprocity doesn’t exist different number of aff and neg speeches and times and we have different obligations.

**Offense**

#### Property rights in space have to be consistent with international law – key to avoiding disputes.

Simberg ’12 [(Rand, MSE in technical management from West Coast University, recognized as an expert in space transportation by the Office of Technology Assessment) “Homesteading the Final Frontier A Practical Proposal for Securing Property Rights in Space,” Competitive Enterprise Institute, April 2012, [https://cei.org/wp-content/uploads/2012/04/Rand-Simberg-Homesteading-the-Final-Frontier.pdf]//](https://cei.org/wp-content/uploads/2012/04/Rand-Simberg-Homesteading-the-Final-Frontier.pdf%5d//) recut akhileshp

But is it true that any recognition of off-planet property claims is de facto a violation of the Outer Space Treaty? Not necessarily. For instance, one could argue that the existence of the Moon Treaty is in and of itself a refutation of the notion that the Outer Space Treaty outlaws private property in space, or else there would be no need for another treaty that essentially explicitly does so. And there is at least one potential loophole that could be exploited by appropriately worded legislation. There are two key assumptions in the legal argument used by opponents of off-planet property claims: 1) that the recognition by a government would only recognize claims by its own citizens; and 2) that it would defend them by force. That need not necessarily be so. Under the treaty, it would in fact be possible for a government, or group of governments, to recognize the property claims of anyone who met specified conditions, regardless of their citizenship or nationality. Such cooperation would obviate the need for physical force to defend claims. The argument that the treaty permits individual property rights was actually made from the very beginning. In 1969, two years after the treaty went into force, the late distinguished space-law professor, Stephen Gorove, noted that under it, “[A]n individual acting on his own behalf or on behalf of another individual or a private association or an international organization could lawfully appropriate any part of outer space, including the [M]oon and other celestial bodies.”32 This clearly provides support for the concept of individual claims off planet under Article II.

#### Deontology’s theorization of humans being valuable as ends in themselves not just means necessitates privatization because each individuals ownership over themselves is converted into ownership of objects over space

Blodger 16 [Ian Blodger The Minnesota Journal of Law, Science & Technology 2016 Reclassifying Geostationar Reclassifying Geostationary Earth Orbit as Priv th Orbit as Private Property: Why ty: Why Natural Law and Utilitarian Theories of Property Demand Privatization <https://scholarship.law.umn.edu/cgi/viewcontent.cgi?article=1006&context=mjlst> ]//aaditg

--Works w any NC that defends natural rights

--Geo = geostationary earth orbit

Analyzing the situation first from a Lockean perspective, GEO should be open to private ownership when individuals have invested their labor in the space.93 Companies that currently have satellites in orbit have invested time and resources sufficient to attain a property right in the orbital zone.94 Looking to the theories of Lockes work, which argue that an increase in value is a necessary condition for labor, satellites in GEO clearly meet the standard.95 Since space is essentially void,96 a satellites presence will increase the value of the space by generating industry and allowing for communications and other activities, which were not possible because that space was empty to begin with.97 One argument against this theory is that the space is at its highest value as void, since the voided area itself allows for travel through that point on future space missions.98 However, this argument would overstate the need for a spacecraft to cross the very narrow belt of satellites in GEO.99 It is also possible to argue that the satellite would produce higher values elsewhere, suggesting an opportunity cost and thus a net loss compared to the current location.100 However, this argument relies on the fluctuating value of the satellite and not the value of the GEO. Since the party launching the satellite already owns it, the question of its value has no bearing on whether they have improved the GEO area for purposes of Lockes theory.101 Thus, under this interpretation of Lockes labor requirement, the space is sufficiently increased in value so that it can be considered property. The same conclusion results under different interpretations of Lockes theory of property. The more general interpretation of Lockes theory is that any time someone interacts with something with the purpose of bringing about a better result, then that interaction constitutes labor and confers a property right in the object.102 The satellites themselves currently occupy a physical location, which does not change relative to Earths position.103 This position prevents other satellites from entering a wide area around the existing satellite, and prevents other satellites from transmitting on frequencies, which are already in use.104 These qualities denote at least a transitive interaction between the person and the GEO area through the satellite, since it was the individuals purpose to place the satellite in that location. Lockes example of tilling the land suggests that transitive relationships between a person and the object of his action are sufficient to confer a property interest.105 Thus, tilling and planting do not necessarily require the actor to physically touch the soil with his body, but rather allow him to do so through the use of tools.106 In the context of a satellite as well, the person who sends the satellite into orbit has a connection with his property and that of the orbital zone.107 This makes sense on the metaphysical level. For Locke, the reason a persons labor converts common areas into private zones is because each person owns his body.108 Here, ownership over the body is converted into ownership over a satellite, and that satellite is used in an exertion of great labor to settle a voided location in space.109 Since a person owns the fruits of his labor, a satellite owner gains a property interest in the GEO occupied by his satellite.110 Therefore under this reading of Lockes theory, anyone who places a satellite in geostationary orbit should be conferred a property right in that space. The labor need not alter the orbit itself, since the orbit is simply a scientific property of a location in space allowing the satellite to remain in a fixed point relative to the earth.111 In this way, the satellite is no different from a house built on Earth since both are bound to a fixed point, and improve the area generally.112 It could be argued that the house inherently alters the ground beneath it by laying foundations and is therefore distinct from a satellite that simply occupies a position. However, pouring concrete in an Earth bound location is the same kind of action taken by placing a satellite in a location bound to Earth, just farther away. Placing a satellite in orbit is similar to transporting materials from one area and erecting them in another location which does confer a property right under Lockes theory (just as a farmer might harvest trees and transport them to his plot to build a house, so the scientist combines electronic components and shoots them off to GEO to make a functioning satellite).113 Spaces lack of matter makes little difference to the question of whether the actor invested labor in a specific location.114

#### Space Commercialization is the extension of free market – every transaction is voluntary and no coercion is involved

Sowers’19 [George Sowers, professor of practice in mechanical engineering at Colorado School of Mines. Space News. “Op-ed | Commercializing Space: Before a commercial LEO market can flourish, the ISS must be retired” March 19, 2019 <https://spacenews.com/op-ed-commercializing-space-before-a-commercial-leo-market-can-flourish-the-iss-must-be-retired/>] //aaditg

The last two decades have seen a great upswing in commercial space endeavors with hundreds of new companies formed and a few prominent billionaires entering the fray. This is all good, but it remains devilishly hard to make money in space without tapping into government space markets. Nevertheless, I’m a firm believer that the commercialization of space is absolutely essential for the growth of the space economy and achieving all of the goals we espouse for human activities in space. So, what do I mean by commercial space? This has been a great topic of debate ever since NASA initiated the commercial cargo and commercial crew programs. There are many definitions and which is appropriate depends on the context. The real distinction is between the public sector and the private sector. Any given space activity can include a mixture of both elements. The purest form of commercial activity takes place entirely within the private sector. It is performed by private-sector companies for the benefit of private-sector customers using private-sector capital. Something like Direct TV would be an example. At the other end of the spectrum is a pure public-sector activity where the activity is performed entirely by public-sector agencies using public-sector employees, entirely funded by public funds for a public purpose. An example would be SLS, but even it is not purely public as several private sector companies are employed. In between are all manner of hybrids involving a mix of investment funds, executing entities and customers. When I talk about commercializing space, I’m talking about growing the purely private sector part of the space economy while recognizing that the space economy in total intertwines public and private in many complex ways. Given that government funding of space activities will likely not grow much, any growth in the overall space economy must come from the private sector. ECON 101 Now the only economic system that can reliability deliver growth is the free market. Some people call it capitalism, but I prefer free market as being more descriptive and without the negative connotations that have arisen around the term capitalism. The free market is based on the principle of economic freedom. That is, every transaction that occurs between one or more parties is completely voluntary. No coercion of any kind is involved. For example, when you walk into a grocery store and buy a bag of apples, no one forced you to do it. It was your choice. And no one forced the store to sell apples. It was their choice. The transaction is governed by a price, the value of the exchange amenable to both the buyer and the seller. In that sense, every free market transaction is a win-win situation for both sides. Each gained something. You gained some tasty apples, and the store made a small profit. Of course, there is competition within the free market. That’s one of its strengths. But the competition is between sellers to attract the business of the buyers or consumers as they’re known. Competition among sellers results in choices for consumers, and we all like choices. The supermarket across the street may attract your business by offering more selection or better quality or lower prices or better service. It short, it must provide more value where value is defined by you, the individual consumer.

#### Private entities utilize their own property and resources to fund and conduct space exploration which means – Prohibition of it is a violation of a) Their ability to use their own property (like their rocketships or fuel) to set their ends in space and b). Their freedom to explore unknown horizons such as space.

### 1NC - AT: Space Debris

#### 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.

#### Kessler’s Syndrome wrong and super long timeframe

Kurt 15 – JD-William & Mary Joseph Kurt, JD- William & Mary School of Law, BA-Marquette University, NOTE: TRIUMPH OF THE SPACE COMMONS: ADDRESSING THE IMPENDING SPACE DEBRIS CRISIS WITHOUT AN INTERNATIONAL TREATY, 40 Wm. & Mary Envtl. L. & Pol'y Rev. 305 (2015)//ww pbj

A. Practical Considerations: Feasible Solutions to the Space Debris Problem Are on Their Way One key question in assessing whether an international treaty is a requisite for solving the space debris problem is just how difficult it will be to fashion a remedy. The more complex and costly are feasible solutions, the more likely it is that a comprehensive regime is necessary to bind the various actors together. 93Link to the text of the note A good place to begin is to determine just how imminent is the onset of the cascade of exponentially more frequent debris-creating collisions, known as the Kessler Syndrome. 94Link to the text of the note To be certain, no one can be sure--this phenomenon being subject to highly complex probabilities. 95Link to the text of the note Indeed, experts' estimates of when such a cascade will become irreversible vary [\*316] widely. 96Link to the text of the note The National Research Council produced a report in 2011 that suggested that "space might be just 10 or 20 years away from severe problems." 97Link to the text of the note In fact, the cascading effect has already begun, albeit at a modest pace. 98Link to the text of the note However, Donald Kessler, who first described the eponymous effect in 1978, has significantly recalibrated his own outlook over the years. 99Link to the text of the note Originally, Kessler predicted that catastrophe would result by the year 2000. 100Link to the text of the note That date long passed, Kessler now speaks of a century-long process that "we have time to deal with." 101Link to the text of the note

#### Private space corporations are key to increasing safety in space technology.

**Kennedy 18** [Brian, “Many in US have confidence in what private space companies will accomplish”, Pew Research Center. 22 June 2018. https://www.pewresearch.org/fact-tank/2018/06/22/many-in-u-s-have-confidence-in-what-private-space-companies-will-accomplish/] //DebateDrills LC

Most **Americans express confidence that private space companies will make meaningful contributions in** developing **safe and reliable spacecraft or conducting research to expand knowledge of space**, according to [a recent Pew Research Center survey](https://www.pewresearch.org/internet/2018/06/06/majority-of-americans-believe-it-is-essential-that-the-u-s-remain-a-global-leader-in-space/).

**Private companies** such as SpaceX, Blue Origin and Virgin Galactic **are becoming increasingly important players in space exploration.** The National Aeronautics and Space Administration (**NASA) has**[**paid private companies $6.8 billion**](https://www.washingtonpost.com/news/business/wp/2018/06/15/feature/what-does-it-mean-to-be-a-nasa-astronaut-in-the-celebrity-space-age-of-elon-musk-and-richard-branson/?utm_term=.b1045d9e9863)**to develop launch systems that might send astronauts into space** as early as this year. These companies are also [setting their sights](https://www.popsci.com/who-wants-to-go-to-mars) on going to the moon or Mars in the future.

(81%) are confident that private space companies will make a profit from these ventures. Some 44% of **Americans have a great deal of confidence that private space companies will be profitable**, and an additional 36% have a fair amount of confidence.

But Americans are also cautiously optimistic that private companies will make contributions that benefit U.S. exploration efforts. **At least two-thirds of Americans have a great deal or a fair amount of confidence that private space companies will build safe and reliable rockets and spacecraft** (77%), **conduct** basic **research to increase knowledge and understanding** of space (70%) **or control costs for developing rockets and spacecraft** (65%).

#### The space junk has been put there by PUBLIC entities like governments as well as private entities, even a ban on private entities in space couldn’t solve the problem. As long as anyone is launching anything it is inevitable

**Polyakov 21**, Dr. Max Polyakov, Founder, Noosphere Ventures, Firefly Aerospace, EOS Data Analytics, 5-5-2021, "Where does space junk come from – and how do we clean it up?," World Economic Forum,<https://www.weforum.org/agenda/2021/05/why-we-need-to-clean-up-space-junk-debris-low-earth-orbit-pollution-satellite-rocket-noosphere-firefly/> Livingston RB

Where does space junk come from? **As long as humans launch objects into orbit, space debris is inevitable.** Rocket launches leave boosters, fairings, interstages, and other debris in LEO. So do rocket explosions, which currently account for seven of the top 10 debris-creating events. **Human presence also creates orbital flotsam** – such as cameras, pliers, an astronaut’s glove, a wrench, a spatula, even a tool bag lost during space walks. Some debris is created naturally from the impacts of micrometeoroids – dust-sized fragments of asteroids and comets. With limited lifetimes, **operational satellites can become space debris**. Satellites run out of maneuvering fuel, batteries wear out, solar panels degrade – causing an orbital debris feedback loop, in which the problem is exacerbated when solar panels are sandblasted by micrometeoroids and tiny debris. As with rocket debris, spent satellites eventually re-enter Earth’s atmosphere and burn up, but the process can take years – and the higher they orbit above Earth, the longer those orbits take to decay.