#### Hi, my name is Ethan, and I stand strongly on the affirmation side of the resolution: The appropriation of outer space by private entities is unjust.

## 1AC - Framework

#### First, I would like to go over the framework in this debate. In debate, there are many different issues that we can bring up, such as inequality, or nuclear war. Inequality could worsen quality of life, and nuclear war is less probable but kills more people. So how do we compare these issues? That’s why framework exists.

#### In this debate, the standard should be saving lives. This means that the side who prevents the most amount of deaths should win this debate. In other words, if I prove that the appropriation of outer space by private entities kills more people than not having private entities appropriate space, then it is unjust and you should vote aff in this debate.

#### This is true for 2 reasons.

#### First, it’s the most objective way of measuring impacts. This means that there’s only one way of calculating the winner of this debate. Other ways of evaluating the round like being the most moral or promoting justice have multiple way of measuring them so it’s arbitrary which one they use.

#### Second, it’s impossible to compare things like suffering, freedom, inequality, and racism since there are so many ways it could happen, and you can’t read people’s mind and compare how badly they feel because everyone’s thought process is different. However, minimizing deaths is easier to compare since it doesn’t rely on people’s feelings. Additionally, people’s feelings can change over time so it’s not an exact measure.

#### Third, it’s irreversible. Someone who died can’t come back alive again, while you can regain your freedom or improve people’s wellbeing. This means that preventing deaths is the most important since if someone is dead, nothing good can come out if it. For example, you can’t be alive ever again if you are dead, but well-being can increase in the future.

## 1AC - Debris

#### The first reason why private entities in space in space is bad is debris.

#### According to a publication by Theodore Muelhaupt and others, private companies going to space leads to debris. This piece of evidence is from The International Association for the Advancement of Space Safety, and is great in talking about how private companies substantially increases debris to the point where it becomes a big issue. Specifically, when talking about NewSpace, the new era of space exploration by private companies, it says “The potential for debris creation, the number of conjunctions, NewSpace represents a fundamental change”. The evidence also talks about it how needs to be stopped in the following quote: “If no action were taken, we would expect 2-3 collisions per year. This is clearly unacceptable”.

#### Christopher Intagliata, an MA in Journalism from NYU, talks about how space dust destroys satellites. In “The Sneaky Danger of Space Dust”, he talks about how debris can cause a lot of damage. He says “the dust-sized stuff might leave more insidious, invisible, marks on satellites – by causing electrical damage”. He also talks about how this electrical damage is the culprit for satellite damage from debris.

#### This is made even worse by the fact that every single collision results in even more debris in space. This is known as the Kessler Syndrome. It states that when satellites collide, the satellites break up into really small fragments, the “space dust” that Intagliata mentioned in the piece of evidence referenced earlier, which causes even more debris, and so on.

#### In short, private companies create space debris, which destroys satellites and sets off a chain reaction of ever-increasing amounts of junk in space which can further collide with more and more satellites.

#### So, we’ve talked about why satellites can go down. But why is this bad? Well one possible implication is related to a current event.

#### As you may already know, Russia has invaded Ukraine. President Vladimir Putin announced that anyone interferes will face “consequences you have never seen”. That assumes nukes, and at the very least – war. If a piece of debris took down, for example, a Russian intelligence satellite, we will be a very dangerous situation. Russia could think that another country is starting a war with them and retaliate against the country that they think was most likely to take down an intelligence satellite. And this could set off a war which kills many innocent people. If this war goes nuclear, hundreds of thousands of people will die.

#### As you can see, the threat of a war from space debris is very real.

## 1AC - Africa

#### The second reason why you should vote for the affirmative is Africa mining.

#### Borsa Tosar, talks about how companies are greatly investing in space mining and wanting to go out into space. He says that space mining companies are “attracting millions of dollars of private investment” and “Neil deGrasse argues that the planet’s first trillionaire will undoubtedly be a space miner”.

#### David Oni, a tech analyst in Africa, talks about how this destroys the African economy because the African economy is extremely dependent on mining activities. He says, “African countries are dangerously dependent on mining activities”, meaning that as soon as investors pull away from Africa, the economy collapses.

#### That may seem bad, but it gets even worse from there.

#### Economic decline in Africa can cause conflict and instability. Andreas Foro Tollefsen, a PHD in Human Geography, talks about how there is a significant correlation between low GDP and conflict. He says “A connection between low income and risk of conflict is among the most robust finding in the literature on civil wars”.

#### Additionally, this can escalate to nuclear terrorism due to lack of restrictions on Africa. A piece of evidence published by Tengetile Swane talks about how African terrorism greatly increases the chance of nuclear terrorism and that Africa is uniquely vulnerable. It says “The danger posed by terrorist groups in acquiring nuclear, chemical, or biological weapons on the African continent is more pronounced now than in the past”, and “weak control and regulatory mechanisms which expose Africa’s mining and production sites and borders to illicit terrorist activity and possible acts of nuclear terrorism.”

#### For these reasons, I have proven why the appropriation of outer space by private entities is unjust, and am now open to cross examination and further points of clarification.

## [EVIDENCE, I PARAPHRAZED ABOVE. NONE OF THIS WAS READ, IT’S JUST FOR PROOF MY EV IS LEGIT]

### Debris

#### Privatization = Debris

Muelhaupt et al. 19 – Theodore, Marlon Sorge, Jamie Morin, and Robert Wilson, 6/18/19, Center for Orbital and Reentry Debris Studies, Center for Space Policy and Strategy, The Aerospace Corporation, 30 year Space Systems Analyst and Operator, [“Space traffic management in the new space era,” Journal of Space Safety Engineering, <https://www.sciencedirect.com/science/article/pii/S246889671930045X?via%3Dihub>]

The last decade has seen rapid growth and change in the space industry, and an explosion of commercial and private activity. Terms like NewSpace or democratized space are often used to describe this global trend to develop faster and cheaper access to space, distinct from more traditional government-driven activities focused on security, political, or scientific activities. The easier access to space has opened participation to many more participants than was historically possible. This new activity could profoundly worsen the space debris environment, particularly in low Earth orbit (LEO), but there are also signs of progress and the outlook is encouraging. Many NewSpace operators are actively working to mitigate their impact. Nevertheless, NewSpace represents a significant break with past experience and business as usual will not work in this changed environment. New standards, space policy, and licensing approaches are powerful levers that can shape the future of operations and the debris environment. 2. Characterizing NewSpace: a step change in the space environment In just the last few years, commercial companies have proposed, funded, and in a few cases begun deployment of very large constellations of small to medium-sized satellites. These constellations will add much more complexity to space operations. Table 1 shows some of the constellations that have been announced for launch in the next decade. Two dozen companies, when taken together, have proposed placing well over 20,000 satellites in orbit in the next 10 years. For perspective, fewer than 8100 payloads have been placed in Earth orbit in the entire history of the space age, only 4800 [1] remain in orbit and approximately 1950 [2] of those are still active. And it isn't simply numbers – the mass in orbit will increase substantially, and long-term debris generation is strongly correlated with mass. Table 1. Some announced NewSpace constellations. Operator Number of satellites Altitude (km) Country SpaceX V-band 7518 335–345 US Capella 48 350–650 US Planet Swift 6 350–650 US Black Sky 60 450 US Satellogic NuSat 300 500 Argentina Kepler 140 550 US SpaceX Starlink 1584 550 US Skybox 30 576 US Fleet 100 580 Australia Amazon Kuiper 3236 590–630 US Commsat 800 600 China Kineis 20 600 France Yalini 135 600 Canada Spire 100 651 US Planet Doves 150 675 US Orbcomm 31 750 US Iridium 72 780 US Theia 112 800 US Lucky Star 156 1000 China Telesat LEO 72 1000 Canada Hongyan 300 1100 China Xinwei 32 1100 China SpaceX Starlink 2825 1110–1325 US OneWeb 720 1200 ESA Telesat LEO 45 1248 Canada Astrome Tech 600 1400 India LeoSat 108 1400 US Globalstar 40 1412 US This table is in constant flux. It is based largely on U.S. filings with the Federal Communications Commission (FCC) and various press releases, but many of the companies here have already altered or abandoned their original plans, and new systems are no doubt in work. Although many of these large constellations may never be launched as listed, the traffic created if just half are successful would be more than double the number of payloads launched in the last 60 years and more than 6 times the number of currently active satellites. Current space safety, space surveillance, collision avoidance (COLA) and debris mitigation processes have been designed for and have evolved with the current population profile, launch rates and density of LEO space. By almost any metric used to measure activity in space, whether it is payloads in orbit, the size of constellations, the rate of launches, the economic stakes, the potential for debris creation, the number of conjunctions, NewSpace represents a fundamental change. 3. Compounding effects of better SSA, more satellites, and new operational concepts The changes in the space environment can be seen on this figurative map of low Earth orbit. Fig. 1 shows the LEO environment as a function of altitude. The number of objects found in each 10 km “bin” is plotted on the horizontal axis, while the altitude is plotted vertically. Objects in elliptical orbits are distributed between bins as partial objects proportional to the time spent in each bin. Some notable resident systems are indicated in blue text on the right to provide an altitude reference. The (dotted) red line shows the number of objects in the current catalog tracked by the U.S. Space Surveillance Network (SSN). All the COLA alerts and actions that must be taken by the residents are due to their neighbors in the nearby bins, so the currently visible risk is proportional to the red line. Fig. 1. Objects in LEO orbit by altitude per 10 km altitude bin. Elliptical orbit objects distributed by portion spent in each bin. Some notable existing resident systems are listed on the right. New residents, including some replacement systems, are on the left. (For interpretation of the references to color in this figure, the reader is referred to the web version of this article.) The red line of the current catalog does not represent the complete risk; it indicates the risk we can track and perhaps avoid. A rule of thumb is that the current SSN LEO catalog contains objects about 10 cm or larger. It is generally accepted that an impact in LEO with an object 1 cm or larger will cause damage likely to be fatal to a satellite's mission. Therefore, there is a large latent risk from unobserved debris. While we cannot currently track and catalog much smaller than 10 cm, experiments have been performed to detect and sample much smaller objects and statistically model the population at this size [3]. The (solid) blue line represents the model of the 1 cm and larger debris that is likely mission-ending, usually called lethal but not trackable. If LEO operators avoid collisions with all the objects in the red line, they are nonetheless inherently accepting the risk from the blue line. This risk is already present. The (dashed) orange line is an estimate of the population at 5 cm and larger and is thus an estimate of what the catalog might conservatively be a few years after the Space Fence, a new radar system being built by the Air Force, comes on line (currently planned for 2019) [4]. Commercial companies offering space surveillance services, such as LeoLabs, ExoAnalytics, Analytic Graphics Inc., Lockheed, and Boeing, might also add to the number of objects currently tracked. Space Policy Directive 3 (SPD-3) [13] specifically seeks to expand the use of commercial SSA services. Existing operators can expect a sharp increase in the number of warnings and alerts they will receive because of the increase in the cataloged population. Almost all the increase will come from newly detected debris [5]. The pace of safety operations for each satellite on orbit will significantly change because of the increase in the catalog from the Space Fence. This effect is compounded because the NewSpace constellations described in Table 1 will drastically change the profile of satellites in LEO. The green bars in Fig. 1 represent the number of objects that will be added to the catalog (red or orange lines) from only the NewSpace large LEO constellations at their operational altitudes. This does not include the rocket stages that launch them, or satellites in the process of being phased into or removed from the operational orbits. Neighbors of one of these new constellations may face a radically different operations environment than their current practices were designed to address. Satellites in these large LEO constellations typically have planned operational lifetimes of 5–10 years. Some companies have proposed to dispose of their satellites using low thrust electric propulsion systems, which would spiral satellites down over a period of months or years from operating altitudes as high as 1500 km through lower orbits where the Hubble Space Telescope, the International Space Station, and other critical LEO satellites operate [6]. Similar propulsive techniques would raise replacement satellites from lower launch injection orbits to higher operational orbits. These disposal and replenishment activities will add thousands of satellites each year transiting through lower altitudes and posing a risk to all resident satellites in those lower orbits. More importantly, failures will occur both among transiting satellites and operational constellations, potentially leaving hundreds more stranded along the transit path. Aerospace studies [7–9] have shown that failed satellites, whether they fail during operations or fail during disposal, can pose as great or even greater risk than the many thousands of operational satellites (Fig. 2). Given the rapid flux in the proposed large LEO constellations (LLC), we created a Future Constellations Model (FCM) with elements that represented the characteristics of the different systems being proposed. In our models, almost all the collisions and the resulting debris from those collisions occur because of failed systems. Most large constellation operators intend to perform active collision avoidance for active systems, whether operational or in some stage of check-out or disposal, but failed satellites are assumed to be incapable of maneuver. Fig. 2 also shows that satellites in the disposal phase can contribute to collisions similarly to satellites in the operational phase. Fig 2 Download : Download full-size image Fig. 2. Collisions during operations and disposal over 10 years for various NewSpace Future Constellation Models (FCMs). 4. A notional illustration of workload The highest risk to operational satellites comes from the lethal but non-trackable debris that is depicted in the blue line in Fig. 2. However, operators perform collision avoidance only on the objects that can be tracked and cataloged. Advances in tracking and NewSpace launches will both act to increase this workload. A key element of the problem is that an increase in the LEO population will lead to an increase in close approaches to existing satellites [5], and the potential for accidental collisions. Conjunction prediction, collision probability (Pc), and maneuver planning for most existing satellite operators is a time- and personnel-intensive operation. Orbit analysts, and propulsion, navigation, and communications systems personnel are involved in evaluating and planning maneuvers over several days and must do so even if the ultimate decision is to “fly through” a close approach. Since most existing systems have small numbers of vehicles and the number of conjunctions any given operator experiences is relatively small, COLA remains a manual process. For systems not designed with automated maneuver planning, a COLA assessment that progresses all the way to a maneuver plan can consume considerable effort, whether or not the maneuver is executed. If a large constellation is deployed next to an existing resident system, the existing system may experience many conjunctions and alerts due to its close proximity of the dense new constellation. A sufficiently large constellation will, in effect, form a “shell” where frequent opportunities for conjunctions will be created. For example, Fig. 3 depicts a fictional scenario where 1225 “New” satellites are distributed in 35 planes in circular orbits at 1000 km altitude, at 98° inclination. These are placed near a hypothetical “Old” six-satellite constellation operating in a nearly circular orbit at the same altitude and 63° inclination. Following a common operations practice, we assume that the Old satellite operators flag a conjunction at Pc> 10−7, start COLA assessment with additional tracking at Pc> 10−6, and plan a COLA maneuver when the Pc> 10−5. A conjunction with Pc > 10−4 would typically be considered a significant risk leading most operators to maneuver. Fig 3 Download : Download full-size image Fig. 3. “New” large LEO constellation at same average altitude as “Old” existing constellation. Currently, the Old system in this example would typically see a warning (Pc > 10−6) a few times a month at this altitude, and of those, a few per year might cross the maneuver threshold. For the operations center, this would be multiplied by the number of satellites in the constellation. When the New system parks nearby, the number of COLA alerts jumps substantially. But the number of alerts depends entirely on the error bubble, (covariance) used. If the typical errors of the public external tracking data and the orbit propagation methods that are widely available (General Perturbations, or GP) are used for both constellations, over a 30-day period we see 129 conjunctions that cross the threshold for COLA assessment (Pc> 10−6), and 53 that cross the maneuver planning threshold (Pc> 10−5) (Fig. 4). This is nearly 2 per day. This could be an enormous workload for a manual process. If a high accuracy catalog (Special Perturbations, or “SP”) and a high-fidelity propagator with its typical covariances is used, the number of conjunctions goes from 129 to a more manageable 10. SP data is maintained by the Air Force, but it is not widely available. It is interesting to note that nine of those 10 crossed the maneuver-planning threshold, and of those, four crossed the Pc> 10−4 where many operators would choose to execute a maneuver. Compared to GP, the SP-quality data resulted in far fewer warnings and flagged four very close conjunctions. The operations center would have been able to concentrate on fewer “false alarms”. We also computed the case where GPS-quality owner-operator data was used for both systems, in which we assumed near-real-time owner-operator position data of very high quality was provided by both operators and used in the collision analysis. In this case, NONE of the conjunctions resulted in a warning and no COLA alerts were generated. The closest approach was 99 m, with a Pc of 3.7 × 10−7 using SP. But because of the quality of the GPS-based position data, this conjunction did not raise an alert because the fully-informed operators could be confident that a collision would not occur. Fig 4 Download : Download full-size image Fig. 4. Number of COLA alerts in 30 days for various qualities of position knowledge when a fictional new system is deployed near an existing one. In the example, an operations center for the Old constellation of six satellites could go from about one COLA assessment a week to nearly one per day per satellite, if only the published satellite catalog is available. If a new constellation operates too close to an existing system, the operator workload may become unreasonable using existing processes. But high accuracy data makes this manageable, and GPS-quality owner-operator data for both systems makes the problem vanish. Since these constellations are likely to be operated by different companies or governments, sharing high-quality position data would likely require an active space traffic management organization. Existing operators will not necessarily have large constellations parked nearby, but they will nonetheless be affected by the new activity. The new large constellations’ satellites typically will have relatively short lifetimes and will need frequent replenishment. The traffic transiting up and down will be substantial, and failures could leave stranded objects at intermediate altitudes, permanently increasing the collision risk. 5. Conjunction warning overload NewSpace operators will face a different challenge due to the vast increase in numbers of satellites. While there are likely as many operational plans as there are operators, a large constellation must consider close approaches with itself. Even if there are no neighboring systems, self-conjunctions can occur between two members of the same constellation. Depending on the configuration, a given operator could see hundreds to thousands of self-conjunctions that cross typical warning thresholds each day using current practices. This could be an issue for a space traffic management (STM) agency, even if it is not an issue for the operator. Aerospace models show that for one possible NewSpace constellation, more than 500,000 self-conjunctions each year could result that cross the typical Pc > 10−6 warning threshold. If no action were taken, we would expect 2–3 collisions per year. This is clearly unacceptable. Thus, current tracking accuracy and processes might produce millions of warnings per year for NewSpace operators to prevent half a dozen actual collisions. Under current practices operators would need to sort through an enormous haystack to find the needles, and because a handful of actual collisions will occur, the warnings cannot be ignored.

#### Debris wrecks satellites, Kessler syndrome

Intagliata 17 [(Christopher Intagliata, MA Journalism from NYU, Editor for NPRs All Things Considered, Reporter/Host for Scientific American’s 60 Second Science) “The Sneaky Danger of Space Dust,” Scientific American, May 11, 2017, <https://www.scientificamerican.com/podcast/episode/the-sneaky-danger-of-space-dust/>]

When tiny particles of space debris slam into satellites, the collision could cause the emission of hardware-frying radiation, Christopher Intagliata reports. Aside from all the satellites, and the space station orbiting the Earth, there's a lot of trash circling the planet, too. Twenty-one thousand [baseball-sized chunks](https://www.scientificamerican.com/article/orbital-debris-space-fence/) of debris, [according to NASA](https://www.orbitaldebris.jsc.nasa.gov/faq.html). But that number's dwarfed by the number of small particles. There's hundreds of millions of those. "And those smaller particles tend to be going fast. Think of picking up a grain of sand at the beach, and that would be on the large side. But they're going 60 kilometers per second." Sigrid Close, an applied physicist and astronautical engineer at Stanford University. Close says that whereas mechanical damage—like punctures—is the worry with the bigger chunks, the dust-sized stuff might leave more insidious, invisible marks on satellites—by causing electrical damage. "We also think this phenomenon can be attributed to some of the failures and anomalies we see on orbit, that right now are basically tagged as 'unknown cause.'" Close and her colleague Alex Fletcher modeled this phenomenon mathematically, based on plasma physics behavior. And here's what they think happens. First, the dust slams into the spacecraft. Incredibly fast. It vaporizes and ionizes a bit of the ship—and itself. Which generates a cloud of ions and electrons, traveling at different speeds. And then: "It's like a spring action, the electrons are pulled back to the ions, ions are being pushed ahead a little bit. And then the electrons overshoot the ions, so they oscillate, and then they go back out again.” That movement of electrons creates a pulse of electromagnetic radiation, which Close says could be the culprit for some of that electrical damage to satellites. The study is in the journal Physics of Plasmas.

### Africa

#### Space mining investments now

Tosar 20 [(Borja Tosar, reporter) “Asteroid Mining: A New Space Race,” OpenMind BBVA, May 18, 2020, <https://www.bbvaopenmind.com/en/science/physics/asteroid-mining-a-new-space-race/>]

This is not science fiction. There are now space mining companies, such as [Planetary Resources,](https://www.consensys.space/pr) which has already launched several mini-satellites to test several of its patents. Other companies like [Asteroid Mining Corporation](https://asteroidminingcorporation.co.uk/) or [Trans Astronautica Corporation,](https://www.transastracorp.com/) although still far from their goal, are already attracting millions of dollars of private investment interested in being on the front line of a possible future space business. Is asteroid mining possible? This new space race already began back when the Hayabusa missions successfully returned a few grams of an asteroid’s regolith, so the technology to harvest asteroid material exists, we just have to change the scale. It is no longer a technological problem. Is it economically viable? We are increasingly dependent on rare elements (such as those in the palladium group), which are expensive to exploit on Earth and come with a high environmental cost, so the sum of these two factors could make it profitable to travel to the asteroids to extract these raw materials. Astrophysicist Neil deGrasse argues that [the planet’s first trillionaire will undoubtedly be a space miner.](https://www.cnbc.com/2015/05/01/build-the-economy-here-on-earth-by-exploring-space-tyson.html)

#### Space mining destroys the African economy

Oni 19 [(David, a space industry and technology analyst at Space in Africa. He’s a graduate of Mining Engineering from the Federal University of Technology Akure.) “The Effect of Asteroid Mining on Mining Activities in Africa,” Africa News, 9/24/19, <https://africanews.space/the-effect-of-asteroid-mining-on-mining-activities-in-africa/>]

At the moment, Asteroid mining poses no threat to terrestrial mining; however, this will not hold for long. The space industry is progressing at such a rapid pace, and the prospects are unequivocally mouth-watering. The big question is, will asteroid mining lure away investors in Africa? The planetary resources company estimates that a single 30-m asteroid may contain 30 billion dollars in platinum alone and a 500m rock could contain half the entire world resources of PGM. Considering the abundance of minerals in asteroids, once asteroid mining materialises, it will severely affect the precious metals market, usurp the prices of rare earth minerals, and a whole lot more because minerals that are usually somewhat scarce on earth will be easily accessible on asteroids. While foreign investors run the majority of the large-scale mining activities in the region, reports say that many African countries are dangerously dependent on mining activities. For some African countries, despite massive mineral wealth, their mining sectors are underdeveloped, and this is as a result of much focus on oil resources and a couple of other challenges. The million-dollar question is, what will become of the mining activities in Africa?

#### Economic decline causes conflict

Tollefsen 17 [(Andreas Forø, Peace Research Institute Oslo (PRIO) and Ph.D. in Human Geography from the University of Oslo) “Experienced poverty and local conflict violence," Conflict Management and Peace Science, 12/21/17, <https://www.researchgate.net/publication/320740608_Experienced_poverty_and_local_conflict_violence>]

Civil wars are more frequent than any other type of conflict in the modern era, with the majority occurring in low-income countries (Hegre and Sambanis, 2006; Jakobsen et al., 2013). While most country-level studies find that poverty and inadequate economic development increase the risk of conflict—a relationship that appears to be causal (Braithwaite et al., 2016)—we lack consensus on the precise mechanisms driving this phenomenon (Justino, 2009). Researchers have explained a correlation between low GDP per capita and conflict using diverse hypotheses, including lowered opportunity costs for individuals to rebel (Collier et al., 2009) and responses to a state’s weak capacity (Fearon and Laitin, 2003). However, as argued by Hegre (2016), development’s highly correlated indicators make it difficult to distinguish between the theoretical mechanisms underlying the development– conflict nexus. Moreover, previously proposed models often represent processes operating on various geographical scales at individual, group, and state levels. Few researchers have backed up theoretical expectations with data at scientifically fitting levels of analysis, consequently ignoring intra-country variations of explanatory variables and outcomes. Furthermore, aggregated measures are incapable of capturing significant variations in economic conditions (Elbers et al., 2003) and conflict intensity (Rustad et al., 2011) within countries. In addition, conflict areas are, in general, atypical of a nation as a whole (Buhaug and Lujala, 2005), which calls for a subnational level analysis. Addressing these disconnects—and the fact that most conflict operates at a local level (Rustad et al., 2011)—a recent body of studies has focused on how subnational variations in poverty determine the locations within a country where conflicts break out (Buhaug et al., 2011; Hegre et al., 2009; Østby et al., 2009). To date, their findings are largely mixed, with no consensus yet on strength, direction, or mechanisms behind the relationship. The problem here may be the use of varying proxies for poverty that are only loosely linked to the rationale for conflict and/or insufficient attention on the local sociopolitical context. The present study’s empirical contributions seek to help rectify the inadequate measures of poverty that have come to characterize the literature. To begin with, the article improves our understanding of whether and where a local poverty–conflict nexus exists by deploying experiential data on individuals’ actual wellbeing—which I argue is more closely connected to people’s motives and rationale for taking up arms. Second, the article examines the sociopolitical context’s conditioning effect on the poverty–conflict nexus. This is achieved by including data on individuals’ perceptions surrounding the quality of their local institutions, the presence of group grievances, and local unemployment rates. These factors, I argue, are more closely linked to reasons for fighting than are common proxies such as night-time luminosity and estimates of economic activity, both of which are often derived from dividing GDP per capita by local population counts. Poverty—a state in which individuals’ basic needs go unmet—has been shown to motivate people to join rebellions. Humphreys and Weinstein (2008), for instance, found that poverty predicted inscription in the Revolutionary United Front during Sierra Leone’s civil war. Barrett (2011) similarly saw how promises of loot lured the poor to enlist in the 1997– 1998 dispute in Nigeria’s local government area known as Toto. Combatants of the Toto conflict were also more likely to join the rebellion if they stood to gain personal protection, food, and shelter. For the present study, I developed a dataset by aggregating survey responses from the pan-African Afrobarometer survey to subnational districts and combining the results with information on post-survey violent conflicts. The dataset consists of 4008 subnational districts, spanning 35 African countries. As most districts were only assessed once, thus restricting study of within-unit variation, survey responses were also aggregated to higher-order subnational regions, resulting in a dataset of 111 regions that were surveyed at least twice; this permitted a region-level fixed-effects model design. Using a pooled cross-sectional dataset of districts, I found that high levels of poverty were linked to increases in local conflict-based violence. Districts with a large share of poor individuals, both in absolute terms and relative to country average, had a higher risk ofconflict than more affluent areas. This relationship held in a coarsened exact matching setup, as well as in a region-level fixed effects design with repeated measurements across time. While the results reveal a local poverty–conflict link, they do not aid in uncovering underlying mechanisms. Using interactions models, I found that poverty increased the risk of conflict, although only where local institutions are weak. The results also show that poverty-stricken areas in which individuals strongly perceive group injustice have a greater risk of conflict than similarly impoverished regions with no aggrieved population. A departure from the local individual opportunity cost explanation, local economic opportunities do not seem to condition the poverty–conflict nexus. In sum, the results suggest that while poverty is significantly connected to conflict, high-quality institutions and inclusiveness of ethnic groups can prevent violence. Although a wide range of robustness checks and alternative model specifications were implemented, including matching and fixed-effects models, the issue of endogeneity could not be ruled out; doing so would require some kind of exogenous instrument, which I have been unable to identify. The remainder of this article elaborates on the theoretical framework linking subnational poverty to local conflict-based violence. This is followed by a discussion of existing methods for measuring local poverty and their potential shortcomings. Next presented is the study’s research design and modeling strategy, followed by a discussion of empirical results. The conclusion considers the study’s limitations and proposes avenues for future research on poverty in locations that support rebel groups. Poverty and conflict A direct link A connection between low income and risk of conflict is among the most robust findings in the literature on civil wars (Hegre and Sambanis, 2006). However, there is little consensus on the mechanisms through which poverty may produce conflict. Collier and Hoeffler (1998) claimed that low per-capita income lowers the opportunity cost of rebellion because when they have less to lose from taking up arms, poorer individuals become more inclined to rebel. Fearon and Laitin (2003) observed that poorer countries experience more conflict because they are unable to monitor and control all of their territory, thereby creating pockets of hospitable conditions for insurgents; Tollefsen and Buhaug (2015) identified a similar scenario at the local level.

#### Terrorist escalation is a viable threat

Zwane 18, Tengetile. Nuclear Terrorism as a possible threat to Africa. Diss. University of Pretoria, 2018. (Department of Political Sciences, Faculty of Humanities, University of Pretoria)

CHAPTER 5: CONCLUSION The danger posed by terrorist groups in acquiring and using nuclear, chemical, or biological weapons on the African continent is more pronounced now than in the past, as terrorist groups have shown more interest in upgrading to more sophisticated tactics in their conduct of terror activity and adapt to more modern and advanced ways and means. To understand the real threat posed by the possibility of the terrorist use of WMDs on the continent, one needs only to consider the progress made by various terrorist organisations such as al-Qaeda and Daesh-Sinai (operations of ISIS), with strong affiliations with alShabaab and Boko Haram, operating in various North-Eastern and Western African regions. The continent therefore has a significant role to play in realising the security of nuclear and radioactive materials from these active terrorist organisations and preventing the possible threat of nuclear terrorism in Africa. This research investigated nuclear terrorism as a possible threat to Africa by means of a systematic literature review. It evaluated the findings of relevant individual studies focusing broadly on WMD in Africa; UNSC Resolution 1540 as a central counter-terrorism and nonproliferation instrument in Africa; and the network of global and regional instruments and conventions such as the African Nuclear-Weapon-Free Zone Treaty (Treaty of Pelindaba), the Convention on the Suppression of Acts of Nuclear Terrorism, and the Convention on the Physical Protection of Nuclear Material in support of eliminating the usage of any kind of weapon of mass destruction – be it a nuclear, a biological or a chemical weapon. In the identification of the research theme and motivation of the research study, the paper proposed two policy questions that guide and direct the research, namely: (1) how real is the risk to Africa? and (2) what policy measures would be most effective in reducing that risk? Simply put: what is the appropriate and relevant response by African states to the risk of nuclear weapons in the hands of terrorist organisations? This embraces the research objectives and focus and provides clarity on the risks posed by WMD proliferation in Africa, and subsequently the possible threat of nuclear terror on the continent. 5.1 Overview of the Research Chapter 1 introduced the topic of nuclear terrorism as possible threat in Africa, and the objectives of the research study itself. It also investigated the literature overview and research methodology used in the research, an extended literature review, as it engages in a progressive scholarly discussion to understand the relationship between international nuclear terrorism and its relevance in Africa. Chapter 2 offered conceptual clarification and shed light on the relevant theories and principles underpinning nuclear security. The evaluation accounts for the logic of deterrence in the 21st century security environment which includes non-state actors seeking nuclear power. It demonstrated not just what is being dealt with, but also clarified how the threat has evolved and transformed the rules of global nuclear security to provide a useful understanding of the phenomenon of nuclear terrorism in the modern world and assist how state officials deal with it. Chapter 3 is fundamentally the policy chapter, and therefore attends to the action-steps essential to reduce the inadequate implementation of the multitude of international and regional non-proliferation treaties, specifically the UNSC Resolution 1540 (2004) which aims to strengthen the UN’s efforts to inhibit the proliferation of WMD by non-state actors such as terrorist organisations, as well as the Treaty of Pelindaba which in the same way as UNSC Resolution 1540, “imposes binding obligations on member states to adopt legislation to prevent the proliferation of WMDs and establish appropriate domestic controls to prevent their illicit trafficking” (United Nations 2004). Chapter 4 pointed out how the continent is vulnerable and at high risk to the unlawful trade and trafficking of weapons-usable radioactive uranium because of the prevailing poor control and regulatory mechanisms in Africa, especially the poor security measures in uranium mining and production sites, hence the relevance and importance of Africa surrounding the issues of non-proliferation and the overall issue of nuclear terrorism, and the responsibility of full implementation of UNSC Resolution 1540. It evaluated a variety of challenges that have hindered the full implementation of UNSC Resolution 1540 and proposed recommendations to overcome the marginal contributions by African states to the adequate implementation of the non-proliferation objectives under UNSC Resolution 1540. 5.2 Outcomes i. How real is the risk to Africa? This research was mindful of the various financial, technical, logistical, and military complications that make it extremely unlikely for any extremist organisation to successfully manufacture and launch a full-blown nuclear weapon to yield the aftereffects of nuclear panic and terror, and most likely death (Eaves 2016). Even though these extremist groups lack the resources to make this happen themselves, the continuing vulnerability to theft or possible seizure of nuclear materials, and the availability of sensitive equipment and materials in the nuclear black market, create a serious risk that terrorist organisations may eventually obtain the wherewithal to produce and detonate a nuclear device, or more plausibly, the trafficking of radioactive uranium, which once combined with high explosives, can be used to fabricate a “dirty bomb” (Carter et al. 2007: 2). The research confirmed that a “dirty bomb” is the most conceivable device of choice for terrorist organisations, who are not seeking to manufacture a sophisticated device, because of the various financial and technical complications that make it extremely unlikely for any terrorist organisation to successfully manufacture and launch a full-blown nuclear weapon. The existing weak and easily accessible borders in Africa, and the inadequate security measures in uranium mining and production sites, is maybe the biggest African connection to the issue of non-proliferation that links it to the responsibility of full implementation of UNSC Resolution 1540, and the overall issue of nuclear terrorism. Hence the need to safeguard nuclear material from the hands of terrorist organisations has taken on heightened significance on the continent. African leaders identify the proliferation of nuclear, chemical, and biological weapons as a common threat facing all member states and a threat that should be confronted collectively to ensure that these materials are secured from possible seizure or theft by terrorist organisations. For this reason (and in response to the opening question), even though the vast majority of countries on the continent report to no possession, or intention to acquire any nuclear weapons for these organisations to steal, and also with the shutdown of South Africa’s nuclear weapons programme, the risk of nuclear terror in Africa, even though low, is still significant, as risks posed by the theft and use of these nuclear materials, equipment, and technologies by terrorist organisations in the area are high due to the weak control and regulatory mechanisms which expose Africa’s mining and production sites and borders to illicit terrorist activity and possible acts of nuclear terrorism.