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# Preserve Past Achievements!

Why Drones Should Stay within the  
Missile Technology Control Regime  
(for the Time Being)

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## Summary

Drone proliferation has increased worldwide over the last few years with more than 90 states possessing military drones today. While many of these drones are relatively small and serve only tactical purposes, trade in bigger and armed drones has increased more recently as well. However, there are few international regimes covering drone sales. One of these regimes is, counterintuitively, called the *Missile Technology Control Regime*, MTCR in short. This legally non-binding agreement among 35 mostly Western industrial nations severely restricts the export of rockets, (cruise) missiles and unmanned aerial vehicles (UAVs), or “drones,” which are capable of transporting a payload of 500kg over a distance of 300 kilometers or more, and limits the export of drones with a range of more than 300 kilometers independent of payload.

In November 2017 the regime turned 30. The obligatory celebrations, however, could not distract from the fact that there is a debate about the future of the MTCR, at least the section restricting what today are known as “drones.” That the MTCR covers certain larger drones at all is due to the fact that in the mid-1980s drones were not used as they are used today. By the standards of the time, drones were either used as a smaller variant of a crude cruise missile or for practice purposes, and no one envisaged their ability for real-time reconnaissance and targeted killings. Instead, it was feared that they might be used to deliver a nuclear warhead, biological agents or chemical substances.

Thirty years later, the effectiveness of the MTCR is being questioned, especially by lobbyists from the US arms industry, but by some scholars of strategic studies as well. They argue that the MTCR is too restrictive, that drones are a very unlikely delivery platform for weapons of mass destruction (WMD), that the regime prevents the United States from arming close allies in the fight against the Islamic State of Iraq and Syria (ISIS), prevents America from using drones as a strategic tool to foster ties, and forces allies to meet their needs by buying drones from China, which is not a MTCR member. Instead, they want to streamline the MTCR with, so it focuses only on “traditional” rockets, missiles and cruise missiles.

However, this report argues that there are strong arguments for keeping UAVs within the MTRC, especially because the next generation of drones will be so potent they could foreseeably replace traditional cruise missiles as delivery platforms. Instead of hollowing out the MTCR, this paper calls for a new initiative to make other important drone producers, such as China or Israel, members. As a compromise, however, the report concludes that certain drones could be taken out of the MTCR if there were a new regime with a more specific focus on drone proliferation, following the example of the 2016 initiative by the Obama administration. At the moment, however, the initiative seems to be at best in stasis, and would probably face severe opposition from the current US administration. However, there is a very recent news report that the State Department wants to change the MTCR in such a way that most of the current American drones would be easier to sell but still remain within the limits of the MTCR. While it is too early to judge this proposal based on one source only, at least it opens up a new path worth exploring. But, in any case, it would be reckless to hollow out the MTCR without any kind of safety net, and European states should be prepared to act as rescuers to stave off such efforts.

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## 1. Introduction<sup>1</sup>

In October 2017, the Missile Technology Control Regime (MTCR) celebrated its 30th birthday during its 31<sup>st</sup> Plenary Week, held in Dublin. Co-chaired by Ambassador Breifne O'Reilly from Ireland and Minister-Counsellor Bjarni Vestmann from Iceland, all 35 member states had come together to recognize the achievements of this time-honored regime. While severe storms forced the participants to condense their scheduled five-day meeting into four,<sup>2</sup> conditions were basically calm and solemn inside. But it could have been totally different, as the news agency Reuters had published an exclusive article just days before the celebrations, announcing a US “discussion paper” proposing that sales of drones [...] be treated more leniently than missile technology that the MTCR was designed to regulate” (Spetalnick/Stone 2017).<sup>3</sup>

This might come as a surprise, as most people look at the MTCR as the main instrument for limiting the proliferation of, as the MTCR's website states, “unmanned delivery systems capable of delivering weapons of mass destruction.”<sup>4</sup> Despite being a non-binding agreement rather than a legally binding international treaty, the track record of the 30-year-old MTCR justifies describing the regime as an overall success story (Goldblat 2002: 131) and, as Michael C. Horowitz points out, “many analysts believe that the MTCR has played at least a modestly useful role in restricting long-range missile proliferation” (Horowitz 2017). In Dublin, the member states were more confident and agreed that, despite ongoing missile programs in the Middle East and Asia, the MTCR

“has proved to be an effective multilateral non-proliferation mechanism” and that “[t]he export controls of related items, information sharing, and patterns of cooperation that have been cultivated over the past 30 years have significantly reduced the availability to proliferators of the equipment, technology, and knowledge needed to develop, produce, and acquire Weapons of Mass Destruction (WMD) missile delivery systems, without hindering legitimate trade”<sup>5</sup>

But the MTCR is more than a voluntary regime for limiting the spread of WMD and their respective delivery systems. It is not without a certain irony that almost by chance the MTCR has become one of the few relevant international regimes controlling larger unmanned aerial vehicles (UAVs), commonly known as drones, both in their unarmed and

1 This report is an elaborated, extended and reorganized version of an article written for the Compendium of Research Articles collected by the French Ministry of Europe and Foreign Affairs on the occasion of the 30<sup>th</sup> anniversary of the MTCR. My thanks go to Matthias Dembinski, Marco Fey and Viola Niemack for their very helpful comments and to Matthew Harris for language editing. All remaining errors and spelling mistakes are mine.

2 <http://mtcr.info/report-by-the-mtcr-chair-dublin-plenary-meeting-october-2017/>; 11.4.2018.

3 Regarding their article's trite title, please consider this tweet by Peter W. Singer: <https://twitter.com/peterwsinger/status/929809799923077127>; 16.1.2018.

4 <http://mtcr.info/>; 1.9.2017.

5 <http://mtcr.info/mtcr-plenary-meeting-public-statement-dublin-20th-october-2017/>; 10.11.2017.

armed variants. This fact has led to some debate behind closed doors among at least some member states.

While several current generation drones could also be used to deliver biological or chemical agents or even a small nuclear warhead, unarmed drones have come to be used mostly for reconnaissance or for targeted conventional attacks when armed. For a very long time it was basically the United States which possessed the large drones with a long ranges and payload falling under the MTCR.

In the wake of what has been said to be a “drone revolution,” however, the number of states producing drones has increased significantly, and the worldwide market for drones in general and military drones in particular has surged over the last few years due to exports from a small number of non-MTCR countries, especially China. More than 90 countries have access to, have procured, or are currently using military drones, and more than 30 are said to be developing or already possess armed variants (Catalano Ewers et al. 2017: 4). These numbers have to be taken with a grain of salt, because they include all kinds of military drones, ranging from very small tactical drones with only a limited reach and virtually no payload beyond a camera to large long-endurance variants with a high payload capacity. Many observers believe that drone proliferation should be stopped or at least limited, because drones are seen as a destabilizing weapon (Sauer/Schörnig 2012), lowering the threshold to engaging militarily (Dowd 2013; Kreps/Zenko 2014: 68), often used in what at least should be called a gray zone of international law (Stroh 2011) and posing a danger to existing international law (Ryan 2014). The debate about the legality of the American targeted killings is the most prominent case in point here (for an overview, see, for example, Plaw et al. 2016) and has increased in momentum again with the advent of the Trump presidency (Schörnig 2017a; Zenko 2017).

Thus, while the overall proliferation of drones is indeed rising, the MTCR has been a restraining factor. MTCR member states face severe constraints when it comes to drone sales, due to the MTCR restrictions on at least some categories of drones. In the past, the US has been rather strict in its exports of large drones and, with the exception of Great Britain and Italy, requests for drones from close allies were even turned down. Critics, including American think tanks and US drone manufacturers, have criticized the limitations on international drone sales stipulated by the MTCR as being neither necessary nor in its spirit, and advocate exempting drones from the regimes for economic, political and systematic reasons (e.g., Catalano Ewers et al. 2017). The reasoning varies but one important argument brought forward argues that the MTCR should focus on its core mission of restricting the proliferation of rockets and (cruise) missiles.

In this text I will argue, however, that while the limitations imposed on drone sales by the MTCR might lead to some inconsistencies within the rudimentary international framework for controlling UAV proliferation, and while it is true the MTCR has not stopped all proliferation of larger UAVs, it would be premature to remove drones, or at least certain variants, from the provisions of the MTCR or the fairly strict category – at least until a new and broader regime covering the trade and use of drones has been agreed upon. Although not fundamentally opposing the idea of “streamlining” the MTCR, I will argue that especially in times when arms control is under severe pressure, it is of utmost

importance to safeguard past achievements and honor the arms-control norms embedded in the MTCR.

## 2. The MTCR at a Glance

### 2.1 History and Purpose of the MTCR

The starting point for the MTCR is the Nuclear Capable Missile Technology Transfer Policy of the Reagan administration as outlined in National Security Decision Directive (NSDD) 70 of November 1982 (The Stimson Center 2015: 8) in which the US declared a prohibition of exports of equipment and technology contributing “to a foreign country’s strategic military missile program” and its intent to “[s]eek cooperation with supplier nations in limiting the export of strategic missile related hardware and technology”.<sup>6</sup> Based on this idea, the MTCR was founded in 1987 by the G7 states, i.e., the leading industrialized countries, Canada, France, Germany, Italy, Japan, the United Kingdom and the United States. It consists of the MTCR Guidelines, stipulating purpose and overall structure, and the “Equipment, Software and Technology Annex,” describing all technical aspects in detail.

According to the MTCR website, the purpose of the MTCR is “to limit the risks of proliferation of weapons of mass destruction (WMD) by controlling exports of goods and technologies that could make a contribution to delivery systems (other than manned aircraft) for such weapons”<sup>7</sup> and it explains:

“Such proliferation has been identified as a threat to international peace and security. One way to counter this threat is to maintain vigilance over the transfer of missile equipment, material, and related technologies usable for systems capable of delivering WMD.”<sup>8</sup>

While all participating states adhere to the common export policy guidelines applied to the Annex,<sup>9</sup> the regime is not a legally binding international treaty but rather “an informal political understanding among states” with no formal linkage to the United Nations.<sup>10</sup>

The MTCR Annex features a basic differentiation between two categories of relevant items:

Category I contains delivery systems, including complete rockets and (ballistic) missiles, cruise missiles and unmanned aerial vehicle systems, “capable of delivering at least a 500kg ‘payload’ to a ‘range’ of at least 300km” (with “payload” and “range” being

6 The text of the actual directive can be found under: <https://fas.org/irp/offdocs/nsdd/nsdd-070.htm>; 14.11.2017.

7 <http://mtcr.info/frequently-asked-questions-faqs/>, bullet point #7; 19.10.2017.

8 <http://mtcr.info/frequently-asked-questions-faqs/>, bullet point #4; 19.10.2017.

9 <http://mtcr.info/frequently-asked-questions-faqs/>, bullet point #8; 19.10.2017.

10 <http://mtcr.info/frequently-asked-questions-faqs/>, bullet point #6 and #5; 19.10.2017.

technical terms defined in the Annex). These specifications date back to the 1980s and were chosen because scientists thought 500kg was a realistic lower limit for a nuclear warhead. In addition, Category I includes “major complete subsystems (such as rocket stages, engines, guidance sets, and re-entry vehicles), and related software and technology, as well as specially designed production facilities for these items.”<sup>11</sup> When it comes to the transfer of Category I items, only production facilities are categorically prohibited from export, while all other items are “subject to an unconditional **strong presumption of denial** regardless of the purpose of the export” [bold in original].<sup>12</sup> In other words: it is permissible to export Category I items, but there needs to be a very good reason for it. It is interesting that MTCR membership does not entitle a country to special treatment over non-members, and there is no obligation to supply certain technology to other members upon request.<sup>13</sup> MTCR members have to inform each other about their refusal decisions and are supposed to consult each other before allowing an export which another member had denied. The final decision, however, rests with every individual country.<sup>14</sup>

Category (Cat) II is relevant for full systems with a range of at least 300km, regardless of payload, and contains components with a dual-use capability. The category is less strict when it comes to exports.<sup>15</sup> As the MTCR’s website states in regard to Cat II, “export is subject to licensing requirements taking into consideration the non-proliferation factors specified in the MTCR Guidelines.”<sup>16</sup> If, however, national export authorities come to the conclusion that the relevant component or Cat II system was bought for WMD delivery purposes, the item is again subject to the previously mentioned “strong presumption of denial.”<sup>17</sup>

The technical Annex, which in its latest version published on October 19, 2017 is more than 80 pages long, not only specifies the technical terms but also describes Category I and Category II items in more technical detail in order to avoid misunderstandings. In addition to UAVs with a range of more than 300km, Category II includes UAVs with a lower range, if they have “[a]n autonomous flight control and navigation capability” or the “[c]apability of controlled flight out of the direct vision range involving a human operator,” or should they incorporate, be designed for or modified to incorporate “an aerosol dispensing system/mechanism with a capacity greater than 20 litres” (Item 19.A.3, MTCR 2017: 75). Obviously, these specifications refer to the ability to serve as a nerve gas or bio-weapon delivery system.

11 <http://mtcr.info/frequently-asked-questions-faqs/>, bullet point #13; 19.10.2017.

12 <http://mtcr.info/frequently-asked-questions-faqs/>, bullet point #13; 19.10.2017.

13 <http://mtcr.info/frequently-asked-questions-faqs/>, bullet point #14; 19.10.2017.

14 <http://mtcr.info/frequently-asked-questions-faqs/>, bullet point #14; 19.10.2017.

15 <http://mtcr.info/frequently-asked-questions-faqs/>, bullet point #13; 19.10.2017.

16 <http://mtcr.info/frequently-asked-questions-faqs/>, bullet point #13; 19.10.2017.

17 <http://mtcr.info/frequently-asked-questions-faqs/>, bullet point #13; 19.10.2017.

Despite these clarifications, requests for systems and components mentioned in one of the two categories are to be evaluated on a case-by-case basis. However, several factors are identified by the regime in order to help national administrations come to a conclusion regarding a particular export, including, among others, “[c]oncerns about the proliferation of weapons of mass destruction,” “[t]he capabilities and objectives of the missile and space programs of the recipient state,” “[t]he assessment of the end use of the transfers” or “[t]he risk of controlled items falling into the hands of terrorist groups and individuals.”<sup>18</sup>

As an informal international regime, the MTCR does not have an independent secretariat or staff, and depends on national administrations to fulfill the duties arising from the Guidelines and the Annex. National legislation and policy should therefore be in line with the MTCR, but implementation is the responsibility of the member states and cannot be enforced. Other members have no veto or any other formal possibility of influencing a decision.

When it comes to new admissions into the MTCR, all current members have to accept the new entry unanimously, and the decision is usually based on the respective countries’ export history of MTCR-related technology, but members are free to block the admission of aspirants for whatever reason they choose (Raman 2016).

## 2.2 The MTCR as an Arms Control Regime

More often than not, the MTCR is described as an arms control regime or at least debated in the context of other arms control regimes (e.g., see Goldblat 2002) even if it differs from “classic” great arms control agreements such as START or the CFE Treaty significantly.

In contrast to disarmament, arms control is a broader concept. While disarmament always aims at reducing the existing stocks of weapons (sometimes to zero), arms control primarily aims at regional or global stability (Schelling/Halperin 1961: 1) with the reduction of costs in the armament process and limitation of damage in the case of war as secondary aims. While disarmament might or might not serve the purpose of stability, other means are specifically tailored to bolster stability. For example, measures for enhancing transparency based on existing stockpiles or even restricted and *regulated* armament (in contrast to unrestricted armament) might help to stabilize relations as well. Disarmament can therefore be understood as being a subcategory or a *means* of arms control.<sup>19</sup> While critics might object, arms controllers subsume, for example, controlled armament under arms control, because it might prevent a destabilizing uncontrolled arms

18 <http://mtcr.info/guidelines-for-sensitive-missile-relevant-transfers/>, section 3; 19.10.2017.

19 This is not uncontested, however, and reflects the perspective of an “arms controller” rather than a “disarmer”. So-called “disarmers” see a fundamental difference between disarmament and arms control. According to their view, disarmament is about the actual weapon, as the accumulation of weapons is the main hurdle to peace. In consequence, all measures which do not aim at reduction are not helpful, or even counter-productive. See, among others, Rosert 2011, Schörnig 2017b.

race. In addition, arms control encompasses non-proliferation, in other words, efforts to stop the spreading of certain weapons or a certain technology. Non-proliferation is usually an asymmetric situation, where some states possess the relevant weapon or technology (“haves”) and others do not (“have-nots”). The best known non-proliferation regime is the Non-Proliferation Treaty (NPT), limiting the spread of nuclear weapons. From this perspective, unrestricted proliferation of certain weapons or technology might lead to regional or even global instability. One of the major differences between the NPT and the MTCR is not only their legal status but also the fact that all members of the MTCR are “haves,” whereas the NPT allows membership of both haves and have-nots because the NPT grants certain rights to those states not in possession of nuclear weapons. Article IV of the Non-Proliferation Treaty (NPT), for example, explicitly accepts the “inalienable right of all the Parties to the Treaty” – including Non-Nuclear Weapons States (NNWS) “to develop research, production and use of nuclear energy for peaceful purposes without discrimination.”<sup>20</sup>

While being less formal, of course, the MTCR in turn does not rule out a legitimate interest in civilian space flight: According to the MTCR guidelines, the regime is “not designed to impede national space programs or international cooperation in such programs as long as such programs could not contribute to delivery systems for weapons of mass destruction.”<sup>21</sup> When it comes to form, arms control regimes vary significantly, from bilateral international treaties between superpowers (e.g., START, NEW START, INF, etc.) from multilateral treaties (e.g., OSLO Convention, ATT) or even from informal agreements.<sup>22</sup> Usually only the member states are bound by the agreement and sometimes – as in the case of the MTCR – only politically rather than legally.

When it comes to the relevance of an arms control regime, there is, however, an additional dimension to consider. Rather than just being a formal agreement, arms control regimes are also the expression of agreement about a certain norm among their member states. Norms in this case are not only understood as simple rules governing behavior but as “collective expectations for the *proper* behavior of actors with a given identity” (Katzenstein 1996: 5; my emphasis), for example to limit certain armament, to announce maneuvers in time or to refrain from exporting arms into already unstable regions. In the best case, member states will internalize the specific norm while non-members will also be inclined to adhere to the norm. In the end, there will be overarching agreement that a certain norm should be followed and violation of the norm – even by non-members – will lead to public shaming or even repercussions such as sanctions, etc.

From its beginning 30 years ago, the MTCR acted as a norm-setting arms control institution. Instead of accepting the proliferation of delivery vehicles based on the premise

20 <http://www.un.org/en/conf/npt/2005/npttreaty.html>; 1.9.2017.

21 <http://mctr.info/guidelines-for-sensitive-missile-relevant-transfers>; 1.9.2017.

22 For a broader introduction to basic arms control concepts, see, among others, Goldblat 2002: Ch.1; Larsen 2009; Schörnig 2017b.

that it is not the delivery vehicle which does the damage, the technologically most advanced states of the G7 understood their responsibility and voluntarily restricted their exports of technology they saw as contributing to regional and global instabilities and regarded as highly problematic. But it was not the self-imposed limitation which made the MTCR so important, but the active and positive example it sets while encouraging other states to join and adhere to the same set of norms and principles.

The whole normative logic of the MTCR rests on the assumption that unrestricted and uncontrolled proliferation of WMD is destabilizing – both regionally as well as globally – and might lead to increased casualties and more destruction in the case of war. The MTCR thus addresses two of the basic principles of arms control described above: avoiding war through stability and reduction of damage in the case of war. In contrast to the idea of limiting only the proliferation of WMDs itself, the MTCR stresses that the proliferation of certain delivery systems for either nuclear or (as was added in 1992) biological and chemical weapons should be strictly limited as well. To put it another way, the MTCR calls attention to the fact that delivery platforms are not necessarily innocent and inoffensive *per se* but necessary *enablers* for a weapon to be put to use. They are part and parcel of the *system* of WMD. This approach strengthens the fact that limiting the proliferation of weapons alone might not be sufficient as there is always a minimal likelihood of states acquiring WMD anyway, despite the best efforts to curb proliferation. Advocates of arms control have always stressed that no arms control agreement can offer absolute certainty that the other side will not cheat, nor that cheating will be detected (Miller 2001; Müller/Schörnig 2006: 146–147). What arms control can achieve, however, is significantly increasing not only the costs of cheating but also increasing the chances of getting caught cheating in time (Miller 2001; Müller/Schörnig 2006: 146–147). From this perspective, limiting both access to the delivery system *and* the weapon itself acts like a double-safety mechanism, especially when there are both civilian applications of the limited weapon technology – or in the case of the MTCR: the delivery technology – which might lead to cases of doubt.

The fact that more and more states have followed the idea of the original seven founding nations and either acceded to the MTCR or at least tried to become members shows that the problem addressed by the MTCR is seen to be of significant relevance. And, more important, several states with significant missile technology have agreed to adhere to the MTCR's principles even without being a formal member – such as Israel or China, among others.

### 3. UAVS and the MTCR

#### 3.1 The Perspective of the 1980s

When people think about delivery vehicles for WMD, usually huge ballistic missiles or cruise missiles come to mind. What is often neglected is the fact that the MTCR not only aims at restricting the proliferation of the rockets, missiles and cruise missiles cited in the regime, but also the export of Unmanned Aerial Vehicles (UAVs) – commonly known as drones. In contrast to today’s understanding, however, the MTCR defines UAVs as a rather broad super-category, including cruise missiles as well as the sub-category “other UAVs” – which we today understand as UAVs, Remotely Piloted Aerial Systems (RPAS) or simply “drones.”<sup>23</sup>

When the MTCR was drafted in the mid-1980s and revised a few years later, drones had existed since at least the First World War some 70 years before, but they had yet to reach the level of today’s sophistication.<sup>24</sup> Still in the 1980s, drones were usually used as aerial targets or for reconnaissance purposes, and often sent on one-way missions because automated landing was not available at that time. When recoverable, drones were flown into gigantic nets or “landed” with parachutes, techniques sometimes still used today.<sup>25</sup>

In consequence, in the late 1980s drones were seen as a mere “subset of cruise missiles” (Horowitz 2017) rather than an unmanned plane, and there was fear that they could be used to carry WMDs.

From today’s perspective, however, we clearly see differences between an unmanned airplane and a cruise missile, both technological distinctions (Gormley/Speyer 2003: 7–8) as well as differences in their use. It may not be an exaggeration to argue that drones “have become emblematic of twenty-first century military technologies” (Fuhrmann/Horowitz 2017: 397). They can be described as one of, if not *the* defining weapon systems of our time. In particular the use of drones by the US as the weapon of choice in the global fight against terrorism has led to a high awareness level but also stirred an intense, emotional *and controversial* debate about legal, ethical and strategic aspects.<sup>26</sup> Rather than being the platform for WMD as the designers of the MTCR envisaged, today’s unmanned aerial vehicles usually serve two purposes for the military. They are either used as (unarmed) reconnaissance assets, given their long loitering time and their ability to transmit video in real time, or – to a lesser degree – as unmanned *combat* aerial vehicles

23 In principle the term “drone” only implies a pilotless vehicle, regardless of the environment it is operating in, i.e., air, land, water or even space. In this report, however, I will use the terms UAV and drone interchangeably.

24 For a history of military drones, see Everett 2015.

25 <http://www.emt-penzberg.de/produkte/drohnensystem/spezifikationen.html>; 2.9.2017.

26 Books and articles about the drone debate are countless. Among others, see for example Rae 2014; Bergen/Rothenberg 2015; Plaw et al. 2016; Schörnig 2017a.

(UCAVs), armed with relatively small conventional high-precision air-to-ground missiles – such as the AGM-114 Hellfire<sup>27</sup> – and used for close air support (CAS) as well as attacks against what the military calls “high value targets,” also known as targeted killings in and beyond conventional armed conflicts.

However, it is also true that these relatively prone drones could also be used in the same fashion as cruise missiles, that is as a weapons platform carrying a nuclear warhead or – more probably – biological or chemical agents on a one-way mission, maxing out the flight range of UAVs by trying to avoid opposition. Such scenarios have been debated both in the strategic as well as the scientific community (Altmann 2013: 140–141). This might not be the most likely scenario, as at least the current generation of drones is largely used in anti-aircraft systems (given that the other side actually has access to modern anti-aircraft systems) due to their limitations in speed and agility (Haider 2014). While the need for restrictions of drones within the MTCR might have disappeared over time, from a different perspective the basic idea which led to the restriction of drone sales might still be relevant. Firstly, drones could be used in a terror scenario, where comparatively small commercial drones – admittedly not restricted by the MTCR – could be the delivery vehicle of choice for a chemical or biological agent. ISIS has shown that arming commercial off-the-shelf drones with small grenades is something which can be done in the proverbial backyard garage. These drones have become a huge menace for Iraqi forces and it appears that they have even been used to attack American tanks, until now unsuccessfully.<sup>28</sup> The US military is working intensively on counter-drone measures as – as the website [c4isrnet.com](http://www.c4isrnet.com) puts it – “Counter-drone is the new counter-IED.”<sup>29</sup> Using small commercial drones to deliver a toxin or to deliver radioactive material as a “flying dirty bomb” can no longer be ruled out as a threat anymore. Secondly, as the current generation of slow-flying drones usually does not pose a strategic risk, there might be an inclination to react slowly and halfheartedly to a drone entering one’s airspace, making a successful WMD delivery more likely. But, thirdly, and most importantly due to new designs and the use of jet rather than turboprop engines, the next generations of drones will not exhibit these restrictions any more. Combining speed, agility and advances in Army Intelligence (AI), the next generations of combat drones might be perfectly suited to overcoming air defense systems and to outmaneuvering interceptors or Surface to Air Missiles (SAMs) (Haider 2014). According to professional Air Force staff, these systems might be able to perform extreme 25 g maneuvers, while humans can only take up to 9 g without blacking out even with the help of a “g-suit” to push blood from lower body parts into the brain.<sup>30</sup> Thus, these new unmanned fighter jets could be capable of penetrating

27 [http://www.navy.mil/navydata/fact\\_display.asp?cid=2200&tid=400&ct=2](http://www.navy.mil/navydata/fact_display.asp?cid=2200&tid=400&ct=2); 2.9.2017.

28 [https://www.washingtonpost.com/world/national-security/use-of-weaponized-drones-by-isis-spurs-terrorism-fears/2017/02/21/9d83d51e-f382-11e6-8d72-263470bf0401\\_story.html?utm\\_term=.8d6e206a7cea](https://www.washingtonpost.com/world/national-security/use-of-weaponized-drones-by-isis-spurs-terrorism-fears/2017/02/21/9d83d51e-f382-11e6-8d72-263470bf0401_story.html?utm_term=.8d6e206a7cea); 16.2.2018.

29 <https://www.c4isrnet.com/unmanned/uas/2017/03/21/counter-drone-is-the-new-counter-ied/>; 16.2.2018.

30 <https://www.newscientist.com/article/mg20627562-200-maxed-out-how-many-gs-can-you-pull/>; 16.2.2018.

air defenses and delivering a WMD with the highest precision. While not likely now, the scenario of the drone as a delivery system for a WMD might become more relevant again in the future.

### 3.2 The MTCR in the Drones Arms Control Architecture

When it comes to arms control, neither the possession nor the use of drones is regulated, and the MTCR, with its focus on exports, is one of the very few regimes applicable.<sup>31</sup> The MTCR distinguishes between different types of drones, based on its basic differentiation between so-called Category I and Category II items. Items restricted under Category I include not only missiles and cruise missiles but also UAVs when their capabilities exceed both a 300 kilometer range and 500 kilogram payload threshold. Items restricted under the less strict Category II include UAVs with a range of at least 300 kilometers independent of the payload (Item 19.A.2, MTCR 2017: 75) and – very important – UAVs with “an autonomous flight control and navigation capability” or the “[c]apability of controlled flight out of the direct vision range involving a human operator” and an aerosol dispensing mechanism of more than 20 liters (Item 19.A.3, MTCR 2017: 75).

The other four relevant regimes are a) the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies (WA),<sup>32</sup> b) the Treaty on Conventional Forces in Europe (CFE treaty), c) the UN Register of Conventional Arms,<sup>33</sup> and d) the Arms Trade Treaty (ATT).<sup>34</sup>

Similar to the MTCR, the WA is an export control regime, but with a broader focus,<sup>35</sup> therefore constraining drone exports “to a lesser extent” than the MTCR (Plaw et al. 2016: 298). Membership is rather similar to the MTCR (although again a little broader) and “participating States have to be members of or be acting in accordance with”<sup>36</sup> the MTCR, among other regimes. It is important to note, however, that both the MTCR as well as the Wassenaar Arrangement are non-binding, and their restrictions have to be implemented in national export licensing regulations in order to be effective as “there is no international organization to verify or enforce compliance” (Plaw et al. 2016: 300).

31 To avoid ambiguity in its 2007 Unmanned Systems Roadmap, the US DoD explicitly states that “[b]allistic or semi-ballistic vehicles, cruise missiles, artillery projectiles, torpedoes, mines, satellites, and unattended sensors (with no form of propulsion) are not considered unmanned vehicles.” (Department of Defense 2007: 1)

32 <http://www.wassenaar.org/>; 2.9.2017.

33 <https://www.un.org/disarmament/convarms/register/>; 14.1.2018.

34 While sometimes mentioned, the INF treaty, however, does not restrict UAVs. The argument rests on a rather narrow interpretation of the wording (Gormley/Speyer 2003: 78). It might be worth discussing whether at least future UAVs could be understood as a violation of the spirit of the INF. But that is another matter.

35 <http://www.wassenaar.org/wp-content/uploads/2016/12/WA-LIST-16-1-2016-List-of-DU-Goods-and-Technologies-and-Munitions-List.pdf>; 1.9.2017.

36 <http://www.nti.org/learn/treaties-and-regimes/wassenaar-arrangement/>; 2.9.2017.

The CFE treaty by contrast is not an arms export regime but legally defines the agreed limits of so-called treaty limited equipment (TLE) for its member states, and limits the number of TLE deployed in certain areas. While UAVs were of no concern to the drafters of the treaty, the treaty itself does not distinguish between manned and unmanned airplanes in regard to the agreed limits (Gormley/Speyer 2003: 7; Altmann 2013: 142–143) and thus includes at least certain UAVs in the specified maximum. The relevance of the CFE treaty, however, is limited as a) the ceilings are so high compared with existing inventories that the treaty is virtually of no relevance in limiting UAVs, b) it is only applicable in Europe, and c) it has been suspended since 2007 in any case (Altmann 2013: 143).

The UN Register of Conventional Arms, finally, is “only” a transparency instrument covering the transfer of seven categories of major weapon systems based on national reporting to the register,<sup>37</sup> thus serving a different purpose from the other more restricting regimes. Drones fall under category IV, “combat aircraft,” and category V, “attack helicopters,” thus limiting the reporting of transfers to unmanned aircraft “designed, equipped or modified to engage targets.”<sup>38</sup> Countries are requested to report transfers but, in addition, “can report on their national defence policies, and on the amount of weapons they already own.” Finally, “the Register includes a provision for reporting on procurement through national production.” While more than 170 states have reported to the Register at some point in time, not all countries report every year and sometimes the same military system is reported in different ways due to differing interpretations of the relevant category. But it has to be kept in mind that the Register has no objective beyond the creation of transparency.

Finally, the Arms Trade Treaty is a relatively new instrument with a current membership of 93 states, setting standards for arms trades based on humanitarian considerations and aiming at the prevention and eradication of illicit arms trade. States are required to submit an annual report, thus creating transparency and accountability, but again not all states fulfill this obligation (ATT Baseline Assessment Project 2017). While legally binding, the ATT has no sanctioning mechanisms. The relevant weapons are based on the categories of the UN Register.

Thus, when it comes to restricting the proliferation of unmanned aerial vehicles with the ability to carry (conventional or unconventional) armament – so-called unmanned combat aerial vehicles (UCAVs) – the MTCR is of greatest importance. And it has had some impact, especially on the behavior of the United States.

37 <http://www.un-register.org/Background/Index.aspx>; 18.1.2018.

38 <http://www.un-register.org/Background/Index.aspx>; 18.1.2018.

## 4. Is Drone Proliferation a Problem?

This claim, however, contradicts the empirical trend, which has been visible for some years now, to some extent. Over the last decade, the number of states possessing, using or striving for military drones has increased significantly. According to the US General Accountability Office (GAO), 41 countries had acquired UAVs by 2004, while the number had risen to “at least 76” in 2011 (GAO 2012: 9). However, the GAO report qualified the finding and argued that “the majority of foreign UAVs that countries have acquired fall within the tactical category [...] and typically have a limited operational range of at most 300 kilometers” (GAO 2012: 11). Today it is assumed that 90 plus countries possess drones used by their respective militaries or intelligence services (Catalano Ewers et al. 2017: 2). According to Fuhrmann and Horowitz, of these, “[n]early thirty countries currently have armed drone programs, while more than two dozen states possess advanced unarmed drones” (Fuhrmann/Horowitz 2017: 397). It is unlikely that the trend towards drones will reverse soon.

### 4.1 Are UAVS Undermining the MTCR?

For some time now, the MTCR has come under stress as critics have pointed out the (alleged) discrepancy between the regime’s effectiveness in restricting the proliferation of (ballistic) missiles and its seeming ineffectiveness when it comes to drone proliferation. Three basic arguments are usually advanced, with the first stressing that the MTCR is backward-looking and outdated, restricting mismatched categories of technology based on “arbitrary” limitations of payload and range (Horowitz 2017). Put another way: While it had made sense to limit drones as carriers for WMD 30 years ago, the technology has developed in a different direction and no longer makes sense. “Drones are not missiles,” as Michael Horowitz points out (2017) and, because they resemble crewed aircraft, they should be treated as such, which means they should be exempted from the regime (2017). The second argument takes up the issue of the rise in drone proliferation, arguing that acceleration in drone proliferation might weaken the willingness of MTCR members to adhere to the regime principles when it comes to missiles, because drone exports by some members could be “used by another member to justify that member’s ballistic missile sales” (Horowitz 2017). In other words: in order to save the MTCR’s core – limiting ballistic and cruise missile proliferation – the bitter pill of exempting drones has to be swallowed. The third line of reasoning focuses on the impact of the MTCR on proliferation. As described above, more and more states are attempting to acquire or develop drones and a number of these countries are not members of the MTCR. Critics therefore argue that when it comes to drone proliferation, the MTCR has been of only limited success at best, “raising concerns about the potential for nonmembers to undermine the regimes’ ability to limit drone proliferation” (Plaw et al. 2016: 300). Some observers argue that the proliferation of armed drones is inevitable and that the US is powerless to stop it (Tucker 2014). It is not surprising that drone manufacturers from MTCR countries have echoed this line of reasoning. While being world leaders

technologically, US drone manufacturers have lamented the strict US export rules based on MTCR principles for some time. After all, the worldwide drone market is expected to grow from approx. \$6 billion in 2015 to more than \$22 billion in 2022, with the military market being only a subcategory of the overall market (Diamond 2017). Manufacturers from the US have claimed they are placed at a strategic disadvantage vis-à-vis foreign manufacturers, especially China – not to mention the loss of profits. China has indeed sold its (relatively) sophisticated CH-3 and CH-4 drones to a few states which would have had no chance of buying the American equivalent (Donald 2017), and is also expected to export its most sophisticated armed drone, the CH-5 (Gady 2017). But American firms are not only losing customers and revenues but “also lose the chance to provide logistics and sustainment services that bring even more business over the life cycle of the product,” as the CEO of General Atomics, maker of the notorious MQ-1 Predator and MQ-9 Reaper drone, argued (Insinna 2017). In addition, the more drones a company sells to different customers, the more flight hours accumulate, leading to more detailed feedback and an accelerated improvement of the drone. Finally, in many situations military exports lead to influence over the recipient’s country and create dependencies, so that *realpolitik* arguments come into play as well.

In sum, these three lines of criticism should not be taken lightly: Would it be a sensible move to take drones out of the MTCR, thus not only strengthening its inner coherence and outer acceptance but also gaining influence over buyers while reaping profits and preserving a variety of jobs in manufacturing and maintenance?

## 4.2 Why the MTCR Should Not Be Altered

However, on second thought, it becomes obvious that “streamlining” the MTCR would be a bad idea and would throw the baby out with the bathwater. First, when it comes to proliferation and regime effectiveness, a typical problem of arms control is that people’s expectations of what a regime is capable of are too high. But regimes should not be judged by wishful thinking but by a rigorous analysis of their design. And given its design, it would simply be unfair to assume that the MTCR could completely stop the proliferation of certain weapon systems, as it is only binding for its *members*. In contrast to ballistic missiles and cruise missiles, developing basic teleoperated drones is not difficult and the product itself has a high capacity for dual use – as the booming market for smaller commercial off-the-shelf drones demonstrates. It is no surprise then that after more than a decade of American drone operations other states have made advances with their own drone programs – with varying degrees of success. It is true that at least four non-members of the MTCR are currently developing drones which fall under Category I (China, Iran, Taiwan and the UAE; see Plaw et al. 2016: 300) and that China has actively pushed into the world market, selling armed drones rather liberally. But other important Cat I drone producers are actually MTCR members (the United States, Russia and Turkey). Israel, which is best known for its technologically sophisticated Heron drone (Cat II) has developed a Cat I version, the Heron TP, as well. However, early in 2017 the drone manufacturer Israel Aerospace Industries (IAI) presented an export version of its Heron TP at the Aero India

show in Bangalore. According to IAI vice president Shaul Shaha, it was developed with the MTCR restrictions explicitly in mind, limiting payload to 450 kilograms (Opall-Rome 2017). Before that, Israel had abided by the MTCR rules despite being a non-member – probably to avoid conflict with and pressure from Washington (Inbar 2008: 185). India, the most recent country to join MTCR, becoming a member of the regime in 2016 (Parameswaran 2016), had also been voluntarily observing the MTCR’s rules for almost a decade before entry. Even China has an – admittedly mixed – record of observing the MTCR rules. China voluntarily agreed in 1991, 1992 and 1994 to adhere to the MTCR rules (Kan 2015: 1), but it is not clear whether the Chinese commitment only applies to the original rules from 1987 or also includes the amended version of 1992 (Kan 2015: 1). There has been debate about the sincerity of the Chinese commitment ever since, triggering US sanctions several times (Kan 2015: 56). China had applied for membership on some occasions in the past and at other times was even encouraged to join (Kan 2015: 49), but membership had never been granted when China was willing to join and its application is said to be still “under consideration.”

Generally, despite being limited to its members, the MTCR has thus created an – admittedly weak yet still not negligible – norm of UAV non-proliferation beyond its member states. Rather than fulfilling the unrealistic goal of stopping drone proliferation in general, the MTCR was able to slow down proliferation, notably the proliferation of bigger and more sophisticated combat drones. Especially the US efforts had a tremendous impact, not only by using their diplomatic might to keep other MTCR members in line, but by simply not exporting the technology – not even to close allies.

To underline the importance of that behavior, imagine the following theoretical scenario: What would probably have happened if the United States had decided to export their most advanced Predator and Reaper drones in a less restricted fashion over the last decade or so?<sup>39</sup> When a US drone crashes in enemy or contested areas, US search and rescue units usually try to recover the downed drone (Zenko 2013: 7) to keep the wreckage from falling into the wrong hands for reengineering. If recovery is not possible, the wreckage is destroyed by an airstrike from a manned platform. Because drone technology has only started to mature, loss of individual drones has been a common issue in recent years.<sup>40</sup> It is unlikely that other states could have conducted similar “rescue missions” for downed drones in contested areas, leading to more wreckage on the black market, increased access to cutting-edge US technology for interested adversaries, and ultimately accelerated proliferation.<sup>41</sup> In short: If the MTCR had not been in place, drone

39 By the time of writing, the US has exported its Predator-family drones only to the UK, Spain, Italy and France, but only the UK and Italy have permission to actually arm the drone (Hawser 2017).

40 Already in 2014, more than 400 US military drones had crashed worldwide. See Whitlock 2014.

41 It would be more than ironic, however, if reports were true that several Chinese drone designs do not resemble US models because wreckage was reengineered, but because Chinese hackers stole the blueprints from defense industry servers (Farley 2016). If this were true, American drone manufacturers would lament current Chinese sales only because they themselves fuelled proliferation by not adequately securing their servers.

proliferation would probably be even more dramatic than it already is today, and if the US had sold its drones, things would probably be much worse now.

However, this argument rests on the assumption that drone proliferation is indeed a bad thing. It could be argued that drones are no different from other military equipment, especially not from manned fighter jets, which face no similar restriction. But drones are not planes and many experts agree that the “unmanned” factor adds a new quality over and above manned planes. Drones are said to lower the threshold for resorting to military violence, as there is no fear of losses among one’s own troops (Kreps/Zenko 2014: 68). While the empirical proof for that argument is still lacking due to the small numbers of states actually possessing armed drones (thanks to the MTCR one might add), it has become obvious that states are more willing to take risks, for example the risk of violating other states’ sovereignty (Catalano Ewers et al. 2017: 16). As current modes of operation show, armed drones are well suited for targeted attacks against the leadership cadre of terrorist or insurgent groups as well as the political and military elite of a country (Sauer/Schörnig 2012). They can be seen as a destabilizing weapon, increasing tension in already tense regions when misused.<sup>42</sup> While not every use of a drone is inappropriate – think, for example, of their use for close air support for friendly ground forces – the overall assessment leads to a call for restrictive handling. These problems will increase with the next generation of jet-powered super-agile drones with significantly increased payloads. These systems will not only be as suitable as WMD delivery vehicles as cruise missiles (and potentially even better), but will also lead to significant destabilization of conventional armaments.

Finally, will the accelerating proliferation of drones and the alleged ineffectiveness of the MTCR undermine other restrictions of the MTCR, and will the example of drones open the floodgates for missile proliferation, as some experts fear? As Horowitz argues: “Countries seeking to sell surveillance drones to allies, for example, could see their exports used by another member to justify that member’s ballistic missile sales” (Horowitz 2017). While this scenario cannot be ruled out *per se*, it begs the question how likely is it that states will really follow that path. States might have to accept the losses of revenue caused by not exporting and stick to the norms they agreed to as they have in the past – even if a competitor sells anyway. A way to square the circle would be, as the Israeli case has shown, to come up with modified variants of drones which allow compliance with the MTCR. And finally, most states understand that while drones can be used as a means of transporting WMD, at least *the current generation* drones are different from ballistic missiles because of their limitations in speed, range and payload, and should not be played off against each other. But as argued above, this might change in the future. It might even be the case that the manned fighter plane is a phase-out model as comments

42 See, for example, the Joint Declaration for the Export and Subsequent Use of Armed or Strike-Enabled Unmanned Aerial Vehicles (UAVs), <https://2009-2017.state.gov/r/pa/prs/ps/2016/10/262811.htm>; 20.9.2017.

made by the former Navy Secretary Ray Mabus in 2015 suggest (Harrison 2015),<sup>43</sup> and that next-generation drones will push currently diverging paths between missiles and planes closer together again. Thus, exempting drones from the MTCR based on current technology and the current generation of drones might simply be premature because no other weapons system is undergoing change comparable to the dynamic changes being experienced by UAVs.

## **5. The US Drone Export Policy under Obama and Trump**

It should be obvious from the debate so far that at least some important actors within the US have a vested interest in less restricted drone exports, first and foremost the US defense industry but also those who see arms exports in general and drone exports in particular as an instrument of foreign policy by selling not only a weapon but also creating dependencies. It comes as no surprise then that there has been some official thinking about alternative ways of coping with drone proliferation over the last few years. However, the State Department has been a sturdy advocate of the MTCR for decades, and has regularly rejected inquiries about exports. But given the US position as one of the most important drone manufacturers, there seems to be a conviction within the administration that some changes to the existing drone export regimes, both domestically as well as internationally, are unavoidable and necessary.

### **5.1 The 2015 Obama-Initiative and the 2016 Declaration – Untying the Gordian Knot?**

Early in 2015, the Obama administration formulated new rules governing the international export of armed drones (Department of State 2015). The policy stressed that all future sales would “include agreement to principles for proper use,” the requirement of each recipient nation “to agree to end-use assurances as a condition of sale or transfer” and “[e]nd-use monitoring and potential additional security conditions.” The policy continued to substantiate these requests by stating that the use of the exported UAVs should be “in accordance with international law, including international humanitarian law and international human rights law, as applicable,” with a “lawful basis for use of force under international law, such as national self-defense,” forbidding “unlawful surveillance or use [of] unlawful force against their domestic populations.” The policy was in fact walking a tightrope: It attempted to exercise “restraint in sales and transfers,” assessing every sale or transfer “on a case-by-case basis,” and maintaining “the United States’ long-standing commitments under the Missile Technology Control Regime (MTCR)” (Department of State 2015), while its intention was “to preserve an American lead in a fast-growing market

43 See also Clark 2016. For an alternative view see Pietrucha 2015.

but one likely to speed the proliferation of a much-criticized weapon in the battle against terrorism,” as Scott Shane remarked to the New York Times (Shane 2015). According to the NYT, this shift had been long awaited as a move to take drone customers away from Israel and China. Despite its rhetoric, the new policy signaled a significant shift from the rather strict MTCR-based rules to other relevant criteria, and specifically targeted Category I drones (Tucker/Weisgerber 2015). The basic idea behind the new policy was to provide close allies with US high-precision weaponry in the fight against terrorism.

While the requirements described seemed perfectly reasonable *per se*, they left an unpleasant aftertaste, as many US drone operations were criticized by NGOs for violating exactly the international law the policy pretended to adhere to. It had been the US itself which had created what could euphemistically be called a “legal gray zone” with their use of armed drones outside distinct armed conflicts. And it seemed unclear how the new policy would relate to the existing MTCR rules.

But criticism aside, the new policy could be seen as an attempt to kill two birds with one stone: Firstly, to use drone exports as a means of bolstering US drone manufacturers and certain important allies at the same time. And secondly, as an attempt to clarify its own drone policy by means of a self-commitment, setting a normative standard for proper use for the US and others. As a report in the Defense News professional journal argued, summarizing an interview with the expert Michael C. Horowitz:

“New US rules loosening restrictions on exports of armed drones should not only help US companies, but will also aid Washington in shaping ‘global norms of behavior’ when it comes to strike UAVs, an expert said.”

Other observers were more critical. While some, especially in the media, feared a “widespread export of armed drones for the first time” by the US (Ryan 2015), others were disappointed as they felt that the initiative did not do enough. In what appeared to be an op-ed for DefenseOne, two scholars with the Center for Strategic and International Studies (CSIS) argued that the new policy was “little more than a mix of existing rules reflecting an outdated perspective on these important weapons,” still so focused on “range, payload and weapons capacity that it in no way distinguishes what makes drones new and different” (Hunter/Metrick 2015).

Given this broad range of assessments, a sober analysis could only conclude that the impact of the policy was indeed less dramatic than it seemed, as it did not challenge the basic MTCR rules but tried to cautiously change the mindset regarding drones, especially among other MTCR members. As it was pointed out by long-time observers of US defense policy:

“Even before the announcement, it was possible to get a license to export armed military drones – as evidenced by sales of armed Reaper drones to the United Kingdom. The United States has also sold highly capable drones to other close allies such as the Netherlands, Italy, France, and South Korea” (Lichtenbaum/Stohl 2015).

What the new initiative did, according to Lichtenbaum and Stohl, was to raise “the level of scrutiny over the technology,” stressing that much of the relevance of the policy depended

on “whether recipients agree to sign on to the principles or if other potential exporters undercut the strict U.S. requirements” (Lichtenbaum/Stohl 2015).

For the Obama administration, the new policy was not intended to be an end but rather the start of a broader initiative as it concluded with the commitment to “working with other countries to adopt similar standards for the sale, transfer, and subsequent use for military UAS.” The Obama administration had envisaged a two-stage process towards global norms on UAV exports. The first step aimed at creating support among other relevant countries to get the process in motion, with broader negotiations for a voluntary Code of Conduct to follow (Mehta/Opall-Rome 2016).

In October 2016, the US, along with 48 other countries, issued a joint declaration on exports and imports of armed unmanned systems which could serve as the nucleus of a norm with broad acceptance. From the perspective of arms control theory, the declaration addressed very important issues regarding drones by “recognizing that misuse of armed or strike-enabled UAVs could fuel conflict and instability, and facilitate terrorism and organized crime,” demanding “appropriate transparency measures to ensure the responsible export and subsequent use of these systems.”<sup>44</sup> While again recognizing the rights of states to develop UAVs for legitimate purposes, the signatories agreed to five general principles guiding the export and import of armed drones, roughly following the guidelines presented by the US policy of 2015. All states agreed that international norms such as international law (both international humanitarian law – IHL and international human rights law – IHRL) were applicable to the use of armed drones and that exports had to be in line with existing relevant international arms control and disarmament norms and multilateral export control and nonproliferation regimes. A measure to judge potential importers was also mentioned by “taking into account the potential recipient country’s history regarding adherence to its relevant international obligations and commitments.” Finally, the signatories agreed to heed “appropriate voluntary transparency measures [...] including reporting of military exports through existing mechanisms” and a continued discussion, given the “rapid development of UAV technology.”

According to DefenseNews, the State Department, which was again at the helm of the initiative, followed “the blueprint used for the International Code of Conduct against Ballistic Missile Proliferation, commonly called the Hague Code of Conduct” by first getting a small number of states to agree on principles and subsequently working out the fine print in a series of meetings (Mehta 2016). For some time, the State Department had lobbied for other states to join the declaration, but the efforts only became public roughly two months before the official declaration (Mehta/Opall-Rome 2016). The idea was that the signatories would get “a seat at the table” in the upcoming negotiation of standards or a voluntary Code of Conduct (Mehta/Opall-Rome 2016).

44 See “Joint Declaration for the Export and Subsequent Use of Armed or Strike-Enabled Unmanned Aerial Vehicles (UAVs)”, <https://2009-2017.state.gov/r/pa/prs/ps/2016/10/262811.htm>, 5.12.2017.

While the signatories included many important industrialized Western states, the group showed the same deficiencies as the MTCR: China, Russia and Israel were absent (Stohl 2016). Yet, the declaration appeared to be a significant departure from both the MTCR as well as the new US policy. What was not mentioned in the document, for example, was any reference to the MTCR's Categories or that the importing nation had to agree to end-use assurances as a condition of sale or transfer, as had been stipulated by the US doctrine a year and a half earlier. Given the rather vague and weak wording, it is surprising that some analysts concluded that "the language could be seen as restricting to international drone producers" (Mehta 2016). However, in defense of the declaration, it was not understood as the end result, but the prelude to a series of meetings to "hammer out the further details," as Brian Nilsson, deputy assistant secretary for defense trade controls of the U.S. State Department, explained (Mehta 2016). These meetings were supposed to be the "core" of the declaration, according to the DefenseNews analyst Mehta (Mehta 2016).

Unexpected problems came up, however, when the Obama initiative suddenly ran out of time. Only a month after the publication of the Joint Declaration, Donald J. Trump was elected the 45<sup>th</sup> President of the United States. While it was plausible to assume that his opponent Hillary Clinton would in all likelihood have continued the initiative, the future of the whole project was suddenly in jeopardy.

## **5.2 Drone Exports under Trump – a New Debate Coming?**

Despite the turbulent first year of the Trump presidency and despite rumors that the drone manufacturing industry has lobbied the new administration to change the 2015 regulations, the topic of drone exports has received little attention until very recently. The pressure from the industry had intensified late in 2015 after reports that allies of the US, including the United Arab Emirates (UAE), Jordan and Egypt, had purchased Chinese drones due to the Obama administration's reluctance to export to Jordan, citing the MTCR as the relevant restrictions (Mehta 2015; Mehta 2017). It was generally believed that the new administration would be more export oriented, if only to save American jobs. Already in June 2017, the State Department had approved the sale of 22 general Atomics MQ-9B "Sea Guardian" UAVs (Carey 2017), an enhanced maritime variant of the notorious MQ-9 "Reaper."<sup>45</sup> However, this was around the time when India finally became a member of the MTCR. While MTCR membership does not offer any official benefits when it comes to imports, it seems likely that these two incidents were related, and that India now had more favorable status than other potential buyers.

In August 2017, DefenseNews reported that "a review of an Obama-era drone export policy" had been launched, "with expectations in industry that the administration will make it easier to export US-manufactured systems" (Mehta 2017). Another aviation outlet backed the impression that the massive industrial lobbying on behalf of a new

45 <http://www.navaldrone.com/MQ-9B-Guardian.html>; 16.2.2018.

regulation had finally paid off: “Industry is encouraging the review, with one major manufacturer saying it has mounted ‘a very strong campaign’ to educate lawmakers on the consequences of limiting such exports.” (Carey 2017). However, the MTCR would still be an obstacle. In parallel with the news about the new review, another rumor spread:

“Under the current administration, US negotiators are preparing a white paper to present at the MTCR Technical Experts Meeting in October; the expectation is that the paper will make the case that UAVs should be treated differently than the missile technology the regime seeks to contain.”

According to sources familiar with the alleged white paper, the paper aimed at a proposal to shift at least certain UAVs from Category I to Category II. Shortly before the annual meeting in October, Reuters published an “exclusive” article, reporting that “State Department officials attending an annual meeting of the missile-control group in Dublin next week [would] present a ‘discussion paper’ proposing [...] sales of drones” (Spetalnick/Stone 2017). According to yet another DefenseNews article published on December 19, 2017, “American officials floated a white paper during the latest plenary session on the MTCR in October, proposing new language to the treaty” (Insinna/Mehta 2017). This new paper proposed some very interesting ideas, especially that all slow-flying drones with a top speed under 650 kilometers per hour (kph) should automatically be counted as Cat II, independent of range and payload, and therefore be subject to a less strict case-to-case decision making process. This new focus on speed certainly has attractive features, at least from the American perspective. As the top speed of most drones currently in use with US forces is below 650 kph, it would make exporting almost all of these drones easier, while the next generation of technologically most advanced jet-powered drones would stay within Category I, thereby “out of the grasp of other nations” (Insinna/Mehta 2017). In addition, “[t]he 650 kph ceiling would also keep the door open for companies developing cutting-edge rotorcraft that could be modified in the future to be unmanned” (Insinna/Mehta 2017). Finally, it seems that the State Department, which seems to be the driving force behind the new approach, is aware that “any change to the MTCR that loosens restrictions on low-speed drones also needs to be closely examined to ensure that missile technology is still strictly controlled” (Insinna/Mehta 2017). So, does the new focus on speed solve the problems described above?

While it might be too early to tell without more detailed information, the approach is indeed new and, to a certain extent, intriguing, and merits further discussion. The idea of focusing on speed rather than other characteristics would indeed solve some of the problems described above, especially the tendency of next-generation drones to become faster and therefore more attractive as delivery vehicles. To keep fast jet-powered drones within Cat I would be more attractive than the alternative of removing drones from the MTCR altogether. In addition, slower drones would remain within the regime, still restricting their sale, although to a lesser extent. However, a sole focus on speed should not be seen as the solution. As shown in Carl Maria von Weber’s opera *Der Freischütz* (The Marksman), magic bullets have a tendency to be a curse rather than a blessing, and should be dealt with the utmost respect.

First, and most obvious, lowering the threshold for export would fuel proliferation and accelerate it beyond its current speed. Second, removing slower drones from Cat I and putting them into Cat II would probably be interpreted as an indication that they are less of a threat. As the analysis above has shown, this might be true when they are used as a carrier for WMD, but not in other contexts, such as strategic stability. Third, lowering the threshold would probably be a solution with a limited lifespan. Given current development, faster and more agile drones would soon become the system of choice for countering their slower and clumsier predecessors. It is conceivable that in the not too distant future American drone manufacturers will start lamenting that competitors not bound by the MTCR are again selling fast-flying drones.

## 6. How to Proceed?

Calls to exempt drones from the MTCR have been heard for some time – especially from the defense industry. However, until now they have been rejected by the political decision makers. This has been a responsible policy. Drone proliferation has increasingly become a serious problem. And while it did not prevent drone proliferation, the MTCR is the most important international regime for supporting the norm of nonproliferation in that field.

Nevertheless, on its 30<sup>th</sup> birthday, the MTCR is once again being called into question, this time by academics, too. While no one questions their good intentions, calling for an exemption of drones from the MTCR only strengthens those forces critical of arms control in general who believe in superior unilateral power rather than cooperation and mutual restraint. This is even more problematic given that the platitude uttered time and again that arms control is in a crisis has never been more true than today. It would therefore be unwise – to say the least – to give up a working and, at least to some extent, effective regime – or at least parts of it. It would be the wrong signal by any measure. And as long as member states accept the premise that although current-generation drones and missiles are indeed fundamentally different, both need regulation of some sort, negative repercussions for the MTCR *as such* seem unlikely. Instead of meddling with the current regime, in an ideal world states would try to strengthen it. This is especially relevant because the next generations of drones already under trial are much better suited to function in a manner the MTCR feared drones would to begin with: as delivery systems for WMD, especially when speed and agility are combined with AI. The MTCR has been surprisingly forward looking in naming “autonomous flight control and navigation capability” as problematic features of future drones in its annex, and this idea should be preserved. And finally, states should work on getting more of the relevant states into the MTCR. While probably not possible in the short term, getting China and Israel to join the regime should be a medium-term objective, past differences notwithstanding.

However, some of the arguments advanced by critics of the drone section of the MTCR are worth considering. It is indeed more by accident than by design that modern drones are covered by the MTCR and a tailored regime seems more appropriate. While

their use as a delivery platform for WMD cannot be ruled out, conventionally armed drones seem to pose more significant problems for regional stability, at least for the time being. It is also true that clinging to a norm that is considered outdated just for the norm's sake will invite debate and could ultimately lead to erosion. While the new initiative by the U.S. State Department to change the main criterion regarding drones to speed rather than payload and range is worth considering, it might not solve the fundamental problem of drone proliferation, but might fuel it instead. In addition, while keeping current generation drones within Cat II would be better than exempting them altogether, the restrictive effect of Cat II is limited compared with the much stricter Cat I.

The most sensible way to deal with the issue would be to push forward with ideas for a different yet more specific regime covering drones – not only their exports but also more general limitations, including their legitimate use. From this perspective the domestic Obama policy of 2015 followed by the multilateral initiative of 2016 before altering the MTCR can be seen as a responsible way of tackling the issue. Obtaining broad and multilateral support for a more general position before carving out the details was also a wise move. There is little general knowledge about what was going on behind the curtains and whether or not Israel, Russia and China have been approached to join. But it would probably be easier to get, for example, China to join a new regime without the unhappy record of its MTCR candidacy. Once there was a new and comprehensive agreement on such a new regime (by the current MTCR members at least), an adaptation of the original MTCR would be safe, possibly even based on the latest idea of focusing on speed.

It is interesting that even MTCR critics like Michael C. Horowitz agree that to pursue a separate export agreement for drones could be “another option” “in tandem with an exemption” (Horowitz 2017). It seems prudent to build new structures as a replacement before tearing down the old ones. As argued above, the MTCR is one of the few regimes regulating drones; it is a norm setter and a focal point in the debate. Unnecessarily phasing it out is unwise and would put pressure on Wassenaar and any other potential regime dealing with drones. In the transition period, China could be invited to join the MTCR, in other words, its application still under consideration could be accepted. However, getting China to accept non-proliferation norms regarding drones should not be seen as a *conditio sine qua non* for proceeding with a multilateral agreement. Finally, even with a new regime, keeping powerful next-generation drones within MTCR Cat I would be a responsible move, and it would require careful wording to separate those armed drones covered in the new drone regime from those similar to cruise missiles covered by the MTCR.

Yet in international relations neither new norms nor norm evolution come out of thin air. As Harald Müller, former director of the Peace Research Institute Frankfurt, noted: When it comes to norms, “agency is central” (Müller 2013: 337). The history of the MTCR shows that a strong and committed United States could even convince – and sometimes coerce – non-members into compliance with the MTCR rules. Keeping the relevant actors, with the United States at the head of the list, committed will be the most pressing upcoming task, both outside but even more within the MTCR. This will be difficult, given the preferences of the current US administration, but the attempt is worthwhile. At the

moment, however, it seems as if the driving force of the US, visible during the last two years of the Obama administration, has lost momentum. If the reports mentioned above are true, the focus of the new administration is exclusively on promoting and increasing exports. But the Obama initiative is not dead – yet. It could be revived even without the US leading. It would be commendable if interested European countries or the EU took the initiative and gave the US a hand where it has currently slowed down.

## References

- Altmann, Jürgen* 2013: Arms Control for Armed Uninhabited Vehicles: An Ethical Issue, in: *Ethics and Information Technology* 15: 2, 137–52.
- ATT Baseline Assessment Project* 2017: Reviewing 2017 ATT Annual Reports on Arms Exports and Imports: Fulfilling the Promise of the ATT?, Stimson: [http://www.armstrade.info/wp-content/uploads/2014/10/ATT-BAP\\_Reviewing-2017-ATT-Annual-Reports-on-Arms-Exports-and-Imports.pdf](http://www.armstrade.info/wp-content/uploads/2014/10/ATT-BAP_Reviewing-2017-ATT-Annual-Reports-on-Arms-Exports-and-Imports.pdf); 18.1.2018.
- Bergen, Peter L./Rothenberg, Daniel (eds.)* 2015: *Drone Wars. Transforming Conflict, Law, and Policy*, Cambridge.
- Carey, Bill* 2017: Under Trump Administration, U.S. Reviews Drone Export Policy, <https://www.ainonline.com/aviation-news/defense/2017-08-31/under-trump-administration-us-reviews-drone-export-policy>; 11.11.2017.
- Catalano Ewers, Elisa/Fish, Lauren/Horowitz, Michael C./Sander, Alexandra/Scharre, Paul* 2017: *Drone Proliferation. Policy Choices for the Trump Administration (Papers for the President)*, June, <http://drones.cnas.org/wp-content/uploads/2017/06/CNASReport-DroneProliferation-Final.pdf>; 25.10.2017.
- Clark, Colin* 2016: Artificial Intelligence Drone Defeats Fighter Pilot: The Future? in: *breakindefense*, 8.8.2017, <https://breakingdefense.com/2016/08/artificial-intelligence-drone-defeats-fighter-pilot-the-future/>; 25.10.2017.
- Department of Defense* 2007: *Unmanned Systems Roadmap 2007–2032*, [https://www.globalsecurity.org/intell/library/reports/2007/dod-unmanned-systems-roadmap\\_2007-2032.pdf](https://www.globalsecurity.org/intell/library/reports/2007/dod-unmanned-systems-roadmap_2007-2032.pdf); 25.10.2017.
- Department of State* 2015: *U.S. Export Policy for Military Unmanned Aerial Systems*. 17.2.2015, <https://2009-2017.state.gov/r/pa/prs/ps/2015/02/237541.htm>; 3.4.2015.
- Diamond, Christopher* 2017: Global Drone Market Expected to Surpass \$22B by 2022, in: *DefenseNews*, 3.5.2017, <https://www.defensenews.com/air/2017/05/03/global-drone-market-expected-to-surpass-22b-by-2022/>; 12.9.2017.
- Donald, David* 2017: Chinese UAV Spreads Its Wings. 17.6.2017, <http://www.ainonline.com/aviation-news/defense/2017-06-17/chinese-uav-spreads-its-wings>; 13.9.2017.
- Dowd, Alan W.* 2013: *Drone Wars: Risks and Warnings*, in: *Parameters* 42/43: 4/1, 7–16.
- Everett, H.R.* 2015: *Unmanned Systems of World Wars I and II*, Cambridge, MA.
- Farley, Robert* 2016: Did China’s Military Drone Technology Espionage Pay Off in the End?, in: *The Diplomat*, 19.2.2016, <http://thediplomat.com/2016/02/did-chinas-military-drone-technology-espionage-pay-off-in-the-end/>; 16.12.2016.
- Fuhrmann, Matthew/Horowitz, Michael C.* 2017: *Droning On: Explaining the Proliferation of Unmanned Aerial Vehicles*, in: *International Organization* 71: 2, 397–418.
- Gady, Franz-Stefan* 2017: China’s New Killer Drone Ready for Mass Production, in: *The Diplomat*, 18.6.2017, <http://thediplomat.com/2017/07/chinas-new-killer-drone-ready-for-mass-production/>; 12.9.2017.
- GAO 2012: *NONPROLIFERATION. Agencies Could Improve Information Sharing and End-Use Monitoring on Unmanned Aerial Vehicle Exports*, Washington, DC: General Accounting Office.
- Goldblat, Jozef* 2002: *Arms Control. The New Guide to Negotiations and Agreements*, London.

- Gormley, Dennis M./Speyer, Richard* 2003: Controlling Unmanned Aerial Vehicles: New Challenges, in: *The Nonproliferation Review* 10: 2, 1–14.
- Haider, André* 2014: Remotely Piloted Aircraft Systems in Contested Environments. A Vulnerability Analysis, <http://www.japcc.org/wp-content/uploads/2015/03/JAPCC-RPAS-Operations-in-Contested-Environments.pdf>; 16.11.2014.
- Harrison, Todd* 2015: Will The F-35 Be The Last Manned Fighter Jet? Physics, Physiology, and Fiscal Facts Suggest Yes, in: *Forbes*, 29.4.2015, <https://www.forbes.com/sites/toddharrison/2015/04/29/will-the-f-35-be-the-last-manned-fighter-jet-physics-physiology-and-fiscal-facts-suggest-yes/#7672491695fa>; 12.9.2017.
- Hawser, Anita* 2017: Armed UAVs: Who Has Them, Who Wants Them? 2.3.2017, <https://www.defenceprocurementinternational.com/features/air/armed-uavs>; 15.9.2017.
- Horowitz, Michael C.* 2017: Drones Aren't Missiles, in: *The Bulletin of the Atomic Scientist*, <http://thebulletin.org/drones-arent-missiles-so-dont-regulate-them-they-are10859>; 26.6.2017.
- Hunter, Andrew/Metric, Andrew* 2015: Obama's New Drone Export Rules Won't Sell More Drones, in: *Defense One*, 11.3.2015, <http://www.defenseone.com/ideas/2015/03/obamas-new-drone-export-rules-wont-sell-more-drones/107247/>; 12.06.2017.
- Inbar, Efraim* 2008: *Israel's National Security. Issues and Challenges Since the Yom Kippur War*, London/New York, NY.
- Insinna, Valerie* 2017: General Atomics: Export Restrictions Help China Grow Its Drone Tech, in: *DefenseNews*, 18.8.2017, <https://www.defensenews.com/air/2017/08/18/general-atomics-export-restrictions-help-china-grow-its-drone-tech/>; 2.9.2017.
- Insinna, Valerie/Mehta, Aaron* 2017: Here's How the Trump Administration Could Make It Easier to Sell Military Drones, in: *Defense News*, 19.12.2017, <https://www.defensenews.com/air/2017/12/19/heres-how-the-trump-administration-could-make-it-easier-to-sell-military-drones/>; 11.1.2018.
- Kan, Shirley A.* 2015: China and Proliferation of Weapons of Mass Destruction and Missiles: Policy Issues, Congressional Research Service 5.1.2015, <https://fas.org/sgp/crs/nuke/RL31555.pdf>; 11.1.2017.
- Katzenstein, Peter (ed.)* 1996: *The Culture of National Security. Norms and Identity in World Politics*, New York, NY.
- Kreps, Sarah/Zenko, Micah* 2014: The Next Drone Wars: Preparing for Proliferation, in: *Foreign Affairs* 93: 2, 68–79.
- Larsen, Jeffrey A.* 2009: An Introduction to Arms Control and Cooperative Security, in: *Larsen, Jeffrey A./Wirtz, James J. (eds.): Arms Control and Cooperative Security*, London, 1–20.
- Lichtenbaum, Peter/Stohl, Rachel* 2015: What Obama's Drone Export Policy Really Means, in: *Breaking Defense*, 27.2.2015, <https://breakingdefense.com/2015/02/what-obamas-drone-export-policy-really-means/>; 6.5.2015.
- Mehta, Aaron* 2015: Hunter Renews Call for UAV Sales to Jordan, in: *DefenseNews*, 29.10.2015, <https://www.defensenews.com/air/2015/10/29/hunter-renews-call-for-uav-sales-to-jordan/>; 11.11.2017.

- Mehta, Aaron* 2016: White House Rolls Out Armed Drone Declaration, in: DefenseNews, 5.10.2016, <https://www.defensenews.com/breaking-news/2016/10/05/white-house-rolls-out-armed-drone-declaration/>; 12.8.2017.
- Mehta, Aaron* 2017: Trump Administration Launches Review of Drone Export Regulations, in: DefenseNews, 3.8.2017, <https://www.defensenews.com/pentagon/2017/08/03/trump-administration-launches-review-of-drone-export-regulations/>; 12.11.2017.
- Mehta, Aaron/Opall-Rome, Barbara* 2016: Experts Question New Armed Drone Export Policy, in: DefenseNews, 1.9.2016, <https://www.defensenews.com/air/2016/09/01/experts-question-new-armed-drone-export-policy/>; 4.12.2017.
- Miller, Steven E.* 2001: Arms Control in a World of Cheating: Transparency and Non-Compliance in the Post-Cold War Era, in: Anthony, Ian/Rotfeld, Adam Daniel (eds.): A Future Arms Control Agenda. Proceedings of Nobel Symposium 118, 1999, Oxford/New York, NY, 173–89.
- MTCR* 2017: Missile Technology Control Regime (M.T.C.R.) – Equipment, Software and Technology Annex, MTCR, [http://mtrc.info/wordpress/wp-content/uploads/2017/10/MTCR-TEM-Technical\\_Annex\\_2017-10-19-corr.pdf](http://mtrc.info/wordpress/wp-content/uploads/2017/10/MTCR-TEM-Technical_Annex_2017-10-19-corr.pdf); 11.11.2017.
- Müller, Harald* 2013: Agency Is Central, in: Müller, Harald/Wunderlich, Carmen (eds.): Norm Dynamics in Multilateral Arms Control, Athens, GA/London, 337–66.
- Müller, Harald/Schörnig, Niklas* 2006: Rüstungsdynamik und Rüstungskontrolle: Eine exemplarische Einführung in die Internationalen Beziehungen, Baden-Baden.
- Opall-Rome, Barbara* 2017: Israeli Firm to Debut MTCR-Compliant Heron Drone, in: Defense News, 12.2.2017, <https://www.defensenews.com/air/2017/02/12/israeli-firm-to-debut-mtcr-compliant-heron-drone/>; 15.8.2017.
- Parameswaran, Prashanth* 2016: India Finally Joins Missile Technology Control Regime , in: The Diplomat, 30.6.2016, <http://thediplomat.com/2016/06/india-finally-joins-missile-technology-control-regime/>; 23.8.2017.
- Pietrucha, Mike* 2015: Why the Next Fighter Will be Manned, and the One After That, 5.8.2015, <https://warontherocks.com/2015/08/why-the-next-fighter-will-be-manned-and-the-one-after-that/>; 12.9.2017.
- Plaw, Avery/Fricke, Matthew S./Colon, Carlos R.* 2016: The Drone Debate. A Primer on the U.S. Use of Unmanned Aircraft Outside Conventional Battlefields, Lanham/Boulder/New York, NY/London.
- Rae, James DeShae* 2014. Analyzing the Drone Debates: Targeted Killing, Remote Warfare, and Military Technology, New York, NY.
- Raman, Sunil* 2016: Missile Technology Control Regime is the First Step for India's NSG Membership, 27.6.2016, <http://www.firstpost.com/world/missile-technology-control-regime-is-the-first-step-for-indias-nsg-membership-2858822.html>; 19.10.2017.
- Rosert, Elvira* 2011: Rüstung, Rüstungskontrolle und Abrüstung, in: Schlotter, Peter/Wisotzki, Simone (eds.): Friedens- und Konfliktforschung, Baden-Baden, 252–81.
- Ryan, Klem* 2014: What's Wrong with Drones? The Battlefield in International Humanitarian Law, in: Evangelista, Matthew/Shue, Henry (eds.): The American Way of Bombing. Changing Ethical and Legal Norms, From Lying Fortress to Drones, Ithaca, 207–36.

- Ryan, Missy 2015: Obama Administration to Allow Sales of Armed Drones to Allies, in: Washington Post, 17.2.2015, [https://www.washingtonpost.com/world/national-security/us-cracks-open-door-to-the-export-of-armed-drones-to-allied-nations/2015/02/17/c5595988-b6b2-11e4-9423-f3d0a1ec335c\\_story.html?noredirect=on&utm\\_term=.e18da18704bb](https://www.washingtonpost.com/world/national-security/us-cracks-open-door-to-the-export-of-armed-drones-to-allied-nations/2015/02/17/c5595988-b6b2-11e4-9423-f3d0a1ec335c_story.html?noredirect=on&utm_term=.e18da18704bb); 19.3.2015.
- Sauer, Frank/Schörnig, Niklas 2012: Killer Drones – The Silver Bullet of Democratic Warfare?, in: Security Dialogue 43: 4, 363–80
- Schelling, Thomas C./Halperin, Morton H. 1961: Strategy and Arms Control, New York, NY.
- Schörnig, Niklas 2017a: Just When You Thought Things Would Get Better. From Obama's to Trump's Drone War, in: Orient 58: 2, 37–42.
- Schörnig, Niklas 2017b: Rüstung, Rüstungskontrolle und internationale Politik, in: Sauer, Frank/Masala, Carlo (eds.): Handbuch Internationale Beziehungen, Wiesbaden, 959–90.
- Shane, Scott 2015: New Rules Set on Armed Drone Exports, in: New York Times, 18.2.2015, <https://www.nytimes.com/2015/02/18/world/new-rules-set-on-armed-drone-exports.html>; 4.4.2015.
- Spetalnick, Matt/Stone, Mike 2017: Exclusive – Game of Drones: U.S. Poised to Boost Unmanned Aircraft Exports, 10.10.2017, <https://www.reuters.com/article/us-trump-effect-drones-exclusive/exclusive-game-of-drones-u-s-poised-to-boost-unmanned-aircraft-exports-idUSKBN1CG0F4>; 12.10.2017.
- Stohl, Rachel 2016: Statement: The Obama Administration's New Declaration on Export and Use of Drones, 5.10.2016, <https://www.stimson.org/content/rachel-stohl-statement-obama-administration-new-drone-export-declaration>; 15.10.2016.
- Stroh, Philipp 2011: Der Einsatz von Drohnen im nicht-internationalen bewaffneten Konflikt, in: Humanitäres Völkerrecht – Informationsschriften, 24: 2, 73–77.
- The Stimson Center 2015: UAV Export Controls and Regulatory Challenges. Working Group Report, <https://www.stimson.org/sites/default/files/file-attachments/ECRC%20Working%20Group%20Report.pdf>; 10.2.2016.
- Tucker, Patrick 2014: Every Country Will Have Armed Drones Within 10 Years, in: Defense One, 6.5.2014, <http://www.defenseone.com/technology/2014/05/every-country-will-have-armed-drones-within-ten-years/83878/>; 12.6.2015.
- Tucker, Patrick/Weisgerber, Marcus 2015: Obama To Sell Armed Drones To More Countries, in: DefenseOne, 17.2.2015, <http://www.defenseone.com/technology/2015/02/obama-sell-armed-drones-more-countries/105495/>; 3.4.2017.
- Whitlock, Craig 2014: When Drones Fall From the Sky, in: The Washington Post, 20.6.2014, <http://www.washingtonpost.com/sf/investigative/2014/06/20/when-drones-fall-from-the-sky/>; 12.8.2015.
- Zenko, Micah 2013: Reforming U.S. Drone Strike Policies, Council Special Report No. 65. New York, NY: Council on Foreign Relations, Center for Preventive Action.
- Zenko, Micah 2017: The (Not-So) Peaceful Transition of Power: Trump's Drone Strikes Outpace Obama, 2.3.2017, <http://blogs.cfr.org/zenko/2017/03/02/the-not-so-peaceful-transition-of-power/>; 3.3.2017.