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SPACE & DEFENSE

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Senior Leader Essay: Russian Space Sector
Bruce McClintock

Mining of Celestial Bodies
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REVIEW: *Physics of Wall Street*
Brian Kruchkow

EISENHOWER CENTER
FOR SPACE AND DEFENSE STUDIES



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Editor's Note

Damon Coletta

Senior Leader Essay

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Editor's Note

This issue of *Space & Defense* continues our effort to apply analytical tools from the field of political economy to emergent questions of defense policy. Many of the decision points relate to earth orbit as befits our heritage. Others expand the definition of space to include frontiers of conflict where new technology or novel actors present unresolved challenges for the United States and allied national security establishments.

We believe contributions for this issue on Russia's space sector; a prospective asteroid mining enterprise; criminalized power structures in fragile states; hypersonic weapons development; and the physics of financial markets are diverse manifestations of a single ethos. What unites them is our educated hunch that national security competition in new spaces will involve mixed actors—states, international organizations, sub-state agencies, and non-state entities; mixed motives encompassing geopolitical rivalry and global public goods attained through cooperation; and mixed domains as competitors bring assets to bear across land, sea, air, space, and cyber.

Dealing with this complexity, many of our analyses in *Space & Defense* run across four geopolitical chessboards—trade, finance, global security, and science & technology—reflecting late British political economist Susan Strange's four structures of power. Insightful contributions for our journal probe the multidimensional international security environment for patterns of political behavior that tie action and consequences across these chessboards. Doing so in coherent ways helps policy makers tackle problems of deterrence and international organization for the 21st century at the frontiers of defense policy. It also fulfills the charter of the U.S. Air Force Academy's Eisenhower Center for Space and Defense Studies, which posits an inherent connection between strengthening intellectual foundations of the space policy community and fostering learning across communities—within the U.S. Government and beyond—interested in achieving a world more peaceful, prosperous, and just.

Our journal applauds several organizations within the U.S. Department of Defense that are acting upon a similar hunch about security challenges in new spaces. The Joint Chiefs of Staff (JCS), U.S. Special Operations Command (SOCOM), and U.S. Strategic Command (STRATCOM) among others are expanding their communities of interest (COI), initiating strategic multi-layer assessments (SMA), and in general finding creative ways to bridge *the gap*, a pernicious vacuum separating their policy responsibilities from historical scholarship and social science research.

Space & Defense, consistent with the goals of the Eisenhower Center, encourages participants in these burgeoning transnational communities of interest to try their hand at one or more of the important questions generated by these processes. This particular set of problems is growing as it becomes more refined, right at the nexus of policy-relevant scholarship.

Damon Coletta
USAFA
June 2017

The Russian Space Sector: Adaptation, Retrenchment, and Stagnation

Bruce McClintock

Since the collapse of the Soviet Union, Russia focused on its public space sector and consciously chose not to cultivate competitive, private space companies. Russia's overall space enterprise is now in systemic crisis due to multiple factors and, despite positive rhetoric from the government and with the partial exception of national security space capabilities, faces yet another generation of stagnation.

On October 4, 1957 the Soviet Union launched the first satellite into orbit from a site now known as Baikonur Cosmodrome.¹ The Sputnik surprise launched the Space Race and ushered in an era of rapid advancement in technological and scientific developments. Much has changed for both Russia and the United States in the last sixty years. On March 30, 2017 a private U.S. company successfully launched a commercial satellite into orbit with a previously used first stage booster—a feat never before accomplished and one that may launch a cheaper era of space travel.² The same day in Russia, an investigation into quality control issues in the Russian space industry reported that nearly every engine currently stockpiled for use in Russian Proton rockets is defective.³ This investigation followed a catastrophic year for Russian space launch. In December 2016 a Russian Progress resupply craft burned up in the Earth's atmosphere shortly after liftoff from Baikonur, the

twentieth malfunction of a Russian launcher since 2001, marking an inauspicious end to what many describe as a make-or-break year for Russian commercial space. Another potential indicator of the crisis in the Russian space sector is that last year Russia fell behind the United States and China in the number of space launches. Russia finished 2016 with just 18 launches, compared to China's 19 and America's 20 launches.⁴

The end of the Cold War and the collapse of the Soviet Union presented new opportunities for Russia to reinvent its government and economy, including its remarkable Soviet-era space program. The journey of the Russian space industry since the collapse of the Soviet Union offers a case study in how Russia, in spite of indications to do otherwise, chose not to break with previous models of behavior and organization. In addition, the history indicates that, without a significant change in direction, the Russian space industry likely faces more stagnation and even further decline.

EARLY OPTIMISM AND PUBLIC SPACE SUCCESSSES

While the picture looks less positive now, in the early 1990s there was plenty of optimism and cooperation between Russia and the West that looked likely to benefit the Russian space sector. President Clinton reflected the optimism of the

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² Kenneth Chang, "SpaceX Launches a Satellite with a Partly Used Rocket," *New York Times*, 30 March 2017, https://www.nytimes.com/2017/03/30/science/spacex-launches-a-satellite-with-a-partly-used-rocket.html?emc=edit_nn_20170331&nl=morning-briefing&nlid=70171243&te=1.

³ Matthew Bodner, "Defects Found in Almost Every Russian Proton Rocket Engine," *Moscow Times*, 30 March 2017, <https://themoscowtimes.com/articles/defects-found-in-almost-every-russian-proton-rocket-engine-57584>.

⁴ Matthew Bodner, "Russia Falls Behind the U.S. and China in Annual Space Launches," *Moscow Times*, 29 November 2016, <https://themoscowtimes.com/articles/russia-falls-behind-us-and-china-in-annual-space-launches-for-first-time-ever-56344>.

time in his remarks at the U.S. Naval Academy graduation in 1993: “President Yeltsin and his fellow reformers throughout Russia are courageously leading three modern Russian revolutions, to transform their country from a totalitarian state into a democracy; from a command economy into a market; and from an empire into a modern nation-state.” Budget constraints, system failures (such as the Challenger disaster in 1986) and a desire to continue human space exploration further motivated the United States to assist with Russian integration into the space enterprise supply chain. The signing of a bilateral trade liberalization treaty on commercial satellite launch services did pave the way for “public-public (International Space Station), public-private (NASA and Russian Space Agency subcontracting) cooperation, and for major private joint ventures between U.S. and Russian firms in the aerospace sector.”⁵

This cooperation was most apparent in the public-public sector. Russia and the United States agreed to place U.S. astronauts on the Mir space station and Russian cosmonauts on the U.S. shuttle. Both countries agreed to an ambitious International Space Station (ISS) plan that made Russia a major partner. The Russian Space Agency also agreed to provide resupply for the ISS using Soyuz-launched Progress cargo vehicles and crew transportation to and from the station.⁶ The zenith of the public-public cooperation for Russia was the eventual exclusive use of Soyuz to resupply and staff the ISS following the second shuttle accident in 2002. Overall, the Soyuz System has been remarkably successful over its lifetime.

Russia also had its own internal public sector space successes, independent of the international

⁵ Jeffrey Pigman, “The New Aerospace Diplomacy: Reconstructing Post-Cold War U.S.-Russian Economic Relations,” *Diplomacy and Statecraft* 15(4), 2004, pp. 683–723.

⁶ NASA, the other ISS partners, and the RSA agreed to incorporate major Russian contributions to the new space station totaling one third of the mass of the completed station and almost half of the volume of the station’s pressurized area (Pigman 2004: 703).

community. GLONASS, Russia’s Global Navigation Satellite System, is fully operational and an accepted international system for navigation and timing. This system, originally designed for use by the Russian Aerospace Forces, has grown in popularity as a commercial system for public use, due in no small part to guidance from President Putin. There are other examples, including the Public-Private Partnership between Gazprom Space Systems and Roscosmos. This operator has its own communications satellite constellation, providing services to both institutional and private players.⁷

SIMILAR OPTIMISM FOR RUSSIAN PRIVATIZATION AND COMMERCIALIZATION, DIFFERENT RESULTS

The end of the Cold War accelerated an overall shift in U.S. space policy—inspiring the commercialization of space and encouraging the private sector to take on as much space development work as was commercially feasible.⁸ From a U.S. perspective, many assumed that the combination of bilateral agreements and public-public cooperation would pave the way for similar commercialization in the Russian space industry. In fact, Russia never truly intended to commercialize its industry. Russia’s true intent was to make its space sector more competitive while retaining government control.⁹

Both United States and Russian firms had to adjust their business models from primarily defense work to accommodate commercial work. However, Russian firms faced challenges that U.S. firms did not. Most importantly, Russian firms all came from a Soviet model that centralized control

⁷ Email exchange with Ivan Kosenkov, 5 December 2016.

⁸ Pigman 2004: 700, 706. National Space Policy Directive 2, issued in September 1990, actively promoted creation of an international marketplace in commercial space launch services, while still maintaining heavy Cold War-era restrictions on technology transfer and limiting U.S. Government satellite launches to U.S.-built launch vehicles.

⁹ Ivan Kosenkov, “Re: Questions regarding your article,” received by Bruce McClintock, 5 December 2016.

of decision-making and resource distribution. Russian firms, whether fully or partially privatized on paper, still had to develop their functional autonomy as enterprises. This legacy meant that, while Russian companies did gain market share and formed joint ventures with others in the United States and elsewhere, their companies still behaved like state-run entities. Arguably, this behavior was conscious and not a failure on the part of the companies to adapt to Western models.

For example, International Launch Services (ILS), formed in 1995 as a joint venture between Lockheed, Khrunichev and Energia, is today a subsidiary of Roscosmos, the State Corporation for Space. So, while Lockheed and Boeing currently operate United Launch Alliance as a truly private entity operating Atlas launchers, ILS operates Proton launchers as a state-owned monopoly in Russia. Sea Launch provided another well-known example of integration between Boeing, the Russian firm RSC Energia and others.

Other joint ventures occurred at the component level. The most well-known is the Lockheed Martin selection of an Energomash RD-180 for use as a booster on the Atlas V. In 2000 the RD-180 became the first Russian-designed and built propulsion system on a U.S.-designed launch vehicle. The RD-180 remains in use by customers, including the United States even though Energomash is also largely owned by the Russian government.

In general, Russian firms used joint ventures to gain market share without truly privatizing their companies. While not apparent to the West twenty-five years ago, it now seems clear that the Russian government never intended to privatize their industry in the same way the West did.

FACTORS LEADING TO OVERALL DECLINE OF RUSSIA'S SPACE INDUSTRY

In the post-WWII Soviet era, the space sector attracted the best and brightest of Russian talent and significant infrastructure investment. Conversely, severe government funding shortages in the 1990s created early and long-lasting

impacts to the Russian space sector.¹⁰ The lack of funding caused degradation to national constellations, infrastructure, and personnel. Observers visiting Russian rocket facilities in the 1990s reported design, manufacturing, and test facilities in a state of decay. Possibly more telling was the lack of a cadre of young professionals and middle managers ready to take the place of the early Soviet space leaders.¹¹

The immediate impact of the reduced funding was delays in accomplishing new projects. For example, the Russian strategy from the 1990s envisioned a Proton replacement, called Angara, which should have already been fielded. As one analyst put it, “like many things in Russia’s history, the Angara’s path toward the market has not been straightforward or easy.” In 2014, the Angara did have two successful test launches but is still years away from replacing the Proton.¹²

Existing system reliability is also faltering over time. Since 2001, Russia has had anomalies on twelve Proton and eight Soyuz launches, the most recent being the loss of a Progress resupply mission on December 1st, 2016. Some of the launch failures have been directly attributed to quality control lapses. For example, in 2009, a communications satellite was placed in incorrect orbit due to a mission software error. In 2010, a Proton rocket failed because it was loaded with too much propellant. In 2013, another Proton crashed because it had flight control sensors installed upside-down.¹³

Besides the shock of the lack of funding in the 1990s, the troubling trend of reduced reliability and slow progress on new projects is routinely attributed to several factors.

Brain Drain—Russia’s space specialist population is aging, and their competence is waning due to

¹⁰ Ibid.

¹¹ Jim Marshall, “Questions on Space and Russia,” received by Bruce McClintock, 5 December 2016.

¹² Anatoly Zak, “Getting Its Space Mojo Back,” aerospaceamerica.aiaa.org, November 2016, <https://aerospaceamerica.aiaa.org/features/getting-its-space-mojo-back/>.

¹³ Zak 2016.

the low attractiveness of space careers. This is due in part to reportedly low pay in the space sector. Also, some claim that, to comply with the Russian state secrets law, space workers are not allowed to travel outside of Russia—a big disincentive for young Russians.

Corruption—Generally considered organic to the Russian economic system, corruption has become evident over the last few years in various aspects of the space sector. The most famous example of corruption is the construction of the Vostochny Space Launch center. Russians envisioned Vostochny in the 1990s as a replacement for the Russian reliance on Baikonur. Over the last few years there have been numerous public delays associated with the construction of the launch facility and several cases of managers and workers arrested for corruption. Separately, in January 2017, Roscosmos announced it was withdrawing all second and third-stage engines for the Proton-M rocket, citing "technical reasons." At the same time, Russian media reported that factory bosses manufacturing engines for Russia's Proton-M rocket may have swapped precious metals for cheaper alternatives, possibly leading to the failure of the Proton in December 2016.¹⁴ Elsewhere, there are reports of substantial percentages of state budgets siphoned from major programs and projects as a part of "overhead."

Reduced Budgets—While Russia has improved upon its desultory budgets from the 1990s, this decade it had to reduce government funding for space. As recently as 2014, Russia promised \$70 billion for a ten-year space program. In 2016, struggling economically due to reduced oil prices and international sanctions, the government approved only \$20.5 billion.¹⁵ Not only does reduced funding reduce or delay marquee projects such as lunar exploration; reduced funding further

¹⁴ "Russian Police Investigate Alleged Substitution Scam at Rocket Engine Factory," *Moscow Times*, 25 January 2017,

<https://themoscowtimes.com/news/experts-check-russian-rocket-engines-for-low-quality-metal-56918>.

¹⁵ Matthew Bodner, "Grounded: Economic Crisis Hobbles Russian Space Program," *Moscow Times*, 24 March 2016, <https://themoscowtimes.com/articles/grounded-economic-crisis-hobbles-russian-space-program-52257>.

contributes to decay of the space infrastructure.¹⁶ Indeed, the Russian government publicly acknowledged the crisis in the space industry and has taken actions in an attempt to reverse the slide, not all of them helpful.¹⁷

Multiple Reorganizations—Russia attempted several variations on organizational models for the space industry. Between 2012 and 2015, Russia formed United Rocket and Space Corporation, using leaders from the Russian automobile industry. URSC was granted property rights over space enterprise assets and separated from the state space agency. Uncertainty about responsibility sharing and control, accompanied by additional delays, cancellations, and hardware failures, led to another reorganization in 2015. Effective January 1, 2016, Russia made Roscosmos a state corporation rather than a government agency. This is a return to the previous model—all space industry united in one framework—making the policy and procurement decisions. Roscosmos is now responsible for oversight and business development of most key organizations in the Russian aerospace industry, including Energia, Khrunichev, and Energomash. The Kremlin's stated goal at the time was to make the industry more competitive and profit oriented. Most observers agree that in practice there has been little change in management and organization of such core programs as the Soyuz, Progress, and International Space Station.

Master Plans—Russia's latest Federal Space Program for 2016-2025 (FKP 2025) illuminates the long-term crisis faced by the Russian space

¹⁶ In 2016, for example, Igor Komarov, the head of Roscosmos, publicly noted a "considerable lag in the use of modern development methods, low productivity, and worn machinery" (Zak 2016).

¹⁷ In March 2016, the Roscosmos communications director said, "It's no secret that the reforms that are underway now might not have occurred if the state had not acknowledged that the Russian space industry is in a systemic crisis." Shura Collinson, "Experts Look to Space X Phenomenon in Quest to Develop Russia's Private Space Industry," 4 March 2016, <http://sk.ru/news/b/articles/archive/2016/03/04/experts-look-to-spacex-phenomenon-in-quest-to-develop-russia-1920-s-private-space-industry.aspx>, accessed December 1, 2016.

sector since it is the latest plan that promises progress but ultimately decreases the scope of effort. FKP 2025 effectively prioritizes preservation of Russia's existing satellite constellation, consolidation and streamlining of the decaying space industry, and minimizing delays in the Russian program for lunar exploration.¹⁸

Leadership Changes and Reprimands—The current head of Roscosmos, Igor Komarov, is the fourth Russian space agency director since 2009.¹⁹ More recently, following the 24-hour delay of the inaugural launch from Vostochny, President Putin officially reprimanded Deputy Prime Minister Rogozin, Roscosmos head Komarov, and the head of the manufacturing firm responsible for the problematic component. Leadership changes have done little to improve the current situation.

SKOLKOVO: RECENT EFFORTS TO ENCOURAGE SPACE COMPANIES WITH SPORADIC RESULTS

One effort that has shown some signs of promise for helping form a true private Russian space sector is the Skolkovo initiative. In 2010, Russian President Medvedev launched the Skolkovo Innovation Center, which included a Space and Telecommunications “cluster” among the five core clusters. There is some sign of hope for the private sector via the Skolkovo cluster. As of October 2016, there were more than 180 participants at Skolkovo in various technological domains related to space activities.²⁰ Skolkovo allows these participants to find investment,

partners, and clients on world markets.”²¹ Thus far, the Russian private space sector supported by Skolkovo can claim some modest victories. For example, Dauria Aerospace won a contract in 2012 to create two small space vehicles for Roscosmos. Dauria eventually launched two Perseus-M microsattellites in the United States in 2014. Dauria is still active—working on two smallsats for Roscosmos and developing an earth observation platform named Auriga. Other companies with successes include: SPUTNIX (ground equipment and test facilities for small satellites), Spectralaser (laser ignition modules for Soyuz engines), Kosmokurs (a reusable suborbital launch vehicle for space tourism and scientific experiments) and Lin Industrial (family of light launch vehicles for small satellite launches).

Still, advocates of Skolkovo acknowledge that the number of private space endeavors in Russia is relatively small and the pace of growth could be better. Many blame Roscosmos for the short list of successes to date. In March 2016, representatives from Russian private space companies and Roscosmos debated the level of cooperation between Roscosmos and private companies in Russia. Only last year did Roscosmos say it would allow private companies access to the space services market, and not before 2020.²² Others report passive resistance from Roscosmos against private companies, for example, demanding detailed designs and models of proposed systems before discussing funding. This is not surprising since as a state corporation, Roscosmos does not have much reason to support private start-ups that become competitors.

There are impediments to private space business in Russia other than Roscosmos and the systemic factors already listed. Besides decreasing state funding, Russian firms also lack adequate private investment. In addition, some point out that Russians, often capable of great technological innovation, are not as steeped in the capitalist

¹⁸ There is still some progress on the lunar base plan but at a much lower level. For example, NPO Lavochkin intends to launch one lunar probe every year or two for the next seven years. There are also successes such as the Radioastron mission and preparation of next space observatories—Spektr RG and Millimetron. Kosenkov email, 5 December 2016.

¹⁹ Marcia Smith, “Russia Downscales Lunar Program as Roscosmos Morphs into State Corporation.” 29 Dec 2015, spacepolicyonline, <http://www.spacepolicyonline.com/news/russia-downscales-lunar-program-as-roskosmos-morphs-into-state-corporation>.

²⁰ Skolkovo Space Cluster briefing, October 2016, courtesy of Ivan Kosenkov.

²¹ Ivan Kosenkov, “Role of Skolokovo in the Development of the Russian Private Space Industry,” May 2015, IASP 2015 32nd World Conference Proceedings, Beijing, <http://iasp2015beijing.csp.escience.cn/dct/page/70085>.

²² Collinson, 4 March 2016.

ethos of recognizing and addressing needs of the market.

CONCLUSION

Since the collapse of the Soviet Union, Russia focused on forming an internationally competitive public space sector and consciously chose not to establish a competitive private space sector. Skolkovo's space cluster does provide support for private Russian companies, but numerous institutional factors in the Russian Federation will continue to challenge space entrepreneurs, and Roscosmos will likely gobble up those that show any promise. The one likely exception to this stagnation turns out to be in national security space capabilities.

More broadly, the overall Russian space enterprise wallows in a systemic crisis due to multiple factors and, despite positive rhetoric from the government, likely faces yet another generation of stagnation and decreasing market share. In the best case, which seems unlikely, Russia's space industry will survive and protect its own systems while slowly rebuilding its once great national space capability. Even under this best-case scenario, it would likely take a generation to address the many systemic issues facing Russia. The worst-case scenario is a complete collapse of the Russian space sector except for military capabilities. This also seems unlikely given the numerous, albeit modest, attempts to generate a private space sector in Russia and the government's clear priority on national security and public organizations.

The most probable path for the Russian space sector is enduring stagnation with the odd success outside of critical national security missions, but nothing akin to its former glory. Sadly, following twenty-five years of opportunity, Russia space is a poster child for how *not* to evolve for the next century of space challenges.

Legislating for Humanity's Next Step: Cultivating a Legal Framework for the Mining of Celestial Bodies

Joseph Crombie

Rapid expansion in the space sector by state and private sector actors highlights the need for a new legal regulatory framework, particularly regarding property rights. The exploitation of space-based resources through the mining of asteroids is currently subject to a cold-war era international agreement that did not include clear consideration about how future off-world commercial exploitation might be regulated or property rights assigned. This article explores two empirical examples, the International Seabed Authority and the International Telecommunication Union, to determine whether they provide useful models of a future international legal framework for off-world property rights.

Exploration and exploitation of resources are central themes for Homo sapiens. The history of mankind is littered with examples of great distances and heroic challenges overcome in the face of adversity. After years of steadfast growth, the space industry now appears on the cusp of a new era of rapid expansion in its capabilities and its users (Space Report 2015; Sommariva 2014). Using the *in situ* resources of outer space, commercial enterprise hopes to replicate the private economic growth experienced when new frontiers were explored and developed on earth. To allow this to happen, an updated legal framework is needed to reflect technical developments and ambitions in the contemporary space industry and, which allows, in particular, for property rights to be assigned on celestial bodies, permitting their mining and utilization.

The central research objective of this article is to examine those ambiguities concerning property rights as they relate to celestial bodies. The analysis is exploratory, highlighting advantages and challenges of the empirical examples studied. The first section, below, explores the current legal framework for space activities. The second section details the United Nations role in international cooperation on space. The third and fourth sections respectively analyze existing models of intergovernmental administration namely, the International Seabed Authority and the International Telecommunications Union, providing an informed understanding of what a future legal property rights framework for celestial bodies might include, and what it might

not. Consideration is also given to how property rights on celestial bodies might be governed.

CURRENT LEGAL FRAMEWORK GOVERNING SPACE ACTIVITY

Four international treaties have come into existence through United Nations (UN) resolutions that condition public and private activity in space. International agreements are vital to global commerce because private companies will be less likely to risk their capital without widely shared legal assurances and a regime of mutually recognizing contractual obligations. The first and most significant agreement is the 1967 Outer Space Treaty (OST) (UNOOSA 1967). The OST is the focal point of space law and considers the exploitation and use of outer space as the “province of all mankind” (UNOOSA 1967: 3). This guarantees the freedom of access to space for all states, outlaws national appropriation and the placement of nuclear weapons, forbids military uses of celestial bodies, and sets out a state’s duties and liabilities relevant to its domestic space activity (Johannsson et al. 2015). In regard to the OST forbidding military uses of outer space, it should be noted that this is specific to outlawing all weapons testing, military maneuvers and the creation of military installations only (UNOOSA 1967).

The Rescue Agreement of 1968 was designed to give astronauts any assistance they required in distress, obliging states that they “shall immediately take all possible steps to rescue them

and render them all necessary assistance” (UNOOSA 1968: 6). The agreement also mandated states to provide assistance to a launch state in recovering space objects that returned to earth outside of their territory.

The Liability Convention of 1972 identified that a space object causing damage or loss to human life would be the responsibility of the launching state: “a launching state shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft flight” (UNOOSA 1972: Article 1).

Finally, the Registration Convention of 1975 was intended to provide a mechanism to assist states in the identification of space objects. The agreement created a registry of all objects sent into space, maintained by the Secretary General and available to all (UNOOSA 1975).

A fifth treaty, the 1979 Moon Agreement, was not ratified by any major spacefaring state (Gangale 2009). Christol (1982) argues the primary flaw of the Moon treaty was its inclusion of the *Common Heritage of Mankind* (CHM) principle. This was an extension to a celestial body of the *Province of Mankind* principle within the OST. Hoffstadt (1994) contends that CHM caused disagreement because it was perceived by states as ambiguous, and Pop (2009) alleges it was connected to the ‘New International Economic Order’ favoring developing countries that was shunned by developed states.

THE OUTER SPACE TREATY AND THE DEBATE ABOUT PROPERTY RIGHTS

A crucial obstacle facing the commercialization of outer space and manifestation of private sector ambition is the issue of property rights; these cannot be assigned currently because to insinuate a state has sovereignty over what is being claimed violates the OST’s non-appropriation principle. As Gleeson (2007) notes, international laws apply to states rather than individual entities, placing the responsibility upon the state to enforce entities operating on its territory or on its behalf to conform to international legal obligations. This places the state accountable for the licensing,

authorization and ongoing supervision of its national space activities.

The establishment of property rights within a legal framework is essential to creating an optimal environment for the development of private sector led economic activity in outer space (Johannsson et al, 2015; Tronchetti, 2014). Jakhu & Buzdugan (2008) argue that clarifying issues surrounding right of way, spectrum rights, intellectual property, mineral rights, and title deeds are necessary first steps but cannot be undertaken under the current legal apparatus. For private companies to extract lucrative resources from asteroids or the moon, they would expect to establish property rights to protect their ownership of the minerals they mine.

Widely shared legal norms would likely need to be a starting point for many commercial business plans. Article 2 of the OST expressly forbids the national appropriation of celestial bodies via claims of sovereignty, use or occupation or any other means (UNOOSA 1967). But contradicting arguments exist over whether a ban on national appropriation extends to a ban on individual appropriation, as will now be examined.

While the national appropriation of celestial bodies is explicitly forbidden within the OST, the appropriation by individual means is not explicitly outlawed. Gorove (1968) argues as the dominant proponent of a minority of authors that “the [Outer Space] Treaty in its present form appears to contain no prohibition regarding individual appropriation” (1968: 42) although the generally accepted view is that private appropriation and property rights are not allowed under the OST (O’Donnell & Goldman 1997). A principal reason articulated by Sterns et al. (1996) is that states are not able to license for private appropriation that “which cannot be appropriated publicly” (1996: 53).

Pop (2000) argues that even if a property claim is made it would be unenforceable because to recognize the property claim would be implying national sovereignty over the territory in question and would constitute national appropriation. Indeed, even before the creation of the OST, Jenks (1965) argued that “states bear international responsibility for national activities in space; it

follows that what is forbidden to a state is not permitted to a chartered company created by a state or to one of its nationals acting as a private adventurer” (1965: 201). Academic literature overtly favors the argument that private appropriation is outlawed on celestial bodies. Consequently, Lambright (2003) argues that property rights cannot be claimed by prospective private mining firms on celestial bodies under the existing legal framework.

Some legal commentators have questioned whether asteroids should be defined as celestial bodies or “whether they should be seen instead as chattel because they are moveable property” (Feinman 2014: 220). In support of this, Tingkang (2012) argues that while it is not feasible to move a planet or a moon, an asteroid can be captured and its path altered, and this reclassification would allow for property rights to be claimed and the extraction of resources outside the legal umbrella of the OST. However, this change in definition would not address issues such as how different pieces of a chattel would be claimed, underscoring the need for a new legal framework and not simply a reinterpretation of the existing one. The traditional role of international law is to clarify and regularize state behavior (Leib, 2015). Thus, the ambiguity created under the OST highlights that it is lacking in its key purpose and a new framework is required.

CONTEMPORARY DEVELOPMENTS SHAPING THE SPACE SECTOR

Space policy has previously been manifested through international politics and state rivalries in the form of prestige projects and the substantial growth in the number of military and civilian satellites. But the rapid growth of private-sector enterprise has drastically altered the dynamics of space policy. Since the birth of the space age, the principal and predominantly only players in the space arena have been major space powers such as the United States and Russia.

States committed significant investment of public money into space exploration to gain prestige, security, and for strategic competition with fellow states (Leib, 2015). While these rationales are decidedly present among state motivations today,

the revolution in the private sector’s role has been driven by political and economic trends “towards privatization, commercialization, deregulation, and globalization of almost all human activities” (Jakhu & Buzdugan 2008: 205).

The private sector space industry has burgeoned considerably by the prospect of exploiting what are perceived, rightly or wrongly, as the virtually limitless mineral resources located within celestial bodies. This sector exists alongside and as part of other commercial space players investing in communications, imagery, and launch services.

The advancement of analyzing asteroid geology using spectroscopic analysis has allowed for the identification of resources contained within near-earth asteroids (Sommariva 2015), with the recognition of valuable elements such as platinum group metals, gold, and many others in gargantuan quantities (Lladó et al. 2014). The Earth’s moon has been identified as having large quantities of Helium 3, an element relatively scarce on Earth and vital for future nuclear fusion development (D’Souza et al. 2006). The largest companies are all based in the United States (O’Neill 2015) suggesting an advantage to technologically advanced economies that have the ability to conduct speculative research.

When the OST was negotiated there was no consideration of the technologies that would become commonplace in the future or the growth in the private sector. The size of the space industry has seen steady growth, to \$330 billion in 2014, of which 76% was made up of commercial space activities (The Space Report 2015). Between 1996 and 2006, satellite manufacturing within the United States achieved annual growth levels of 11%, while the rest of the world achieved around 13% (Anderson 2015). Garretson (2008) notes that the number of spacefaring nations will increase as costs are driven down and private operators offer cost effective options to developing states.

Garretson (2008) believes the increase in space actors will lead to a higher probability of accidents, problems, and unnecessary tensions that could be avoided through an up-to-date strategy to manage and further develop space. As

space increasingly becomes a strategic “center of gravity” (Gleeson 2007: 146) for many within the international community, it is important that fresh changes are brought about to address how states and their entities safeguard their interests within space. Sommariva (2014) argues that efforts should be made to enlarge the discussion to create an informed public debate on a matter that affects the lives of everyone on earth.

The United States has historically enjoyed a global leadership position in regard to space activities (Cremins & Spudis 2007), meaning it can exert strong influence on the processes characterizing space activity. In 2014 a bill was introduced to Congress that later went on to become the U.S. Commercial Space Launch Competitiveness Act (Congress 2016). The core of the bill was a provision that recognizes U.S. commercial asteroid resource companies’ property rights over the resources they extract. Tronchetti (2014) argues that while the bill is not intended to extend American ownership over asteroids, this could be its legal effect. Tronchetti (2014) further argues that the Act goes against principles created by the OST and amounts to an attempted amendment of the treaty.

The United States is not the only country to have developed such legislation. Luxembourg announced that it would “seek to jump-start an industrial sector to mine asteroid resources in space by creating regulatory and financial incentives” (Selding 2016:1). The emergence of independent domestic legislation further showcases the failure of the OST in not allowing states to facilitate their own private sector growth within the terms of the treaty.

When the OST was created, Feinmen (2014) argues that it was positively received by the international community. But the creation of independent domestic legislation by states party to the OST shows overt dissatisfaction with it in a modern context. Many authors such as Johannsson et al. (2015), Tronchetti (2014), and Hertzfeld & von der Dunk (2005) argue for the creation of a new international framework. The academic debate on this matter shows an inclination to argue that property rights cannot be claimed under the OST, and multiple efforts to

reinterpret its specifics highlight an aspect of law that is now out of touch with reality.

THE ROLE OF THE UNITED NATIONS

Since its inception in 1945, the United Nations (UN) has been a key player in international affairs. As Urquhart (1993) identifies, following processes of decolonization and the internationally paralyzing nature of the Cold War, the UN became the arena for mediation and conciliation among the world’s states, aiming to maintain and promote international peace and security.

Perez de Cuellar (1989), the UN’s fifth Secretary General, serving 1982-1991, argued that “the United Nations has been a witness, a catalyst and an agent of a massive transition in global affairs” (1989: 1). Its importance to, and central role in, effecting global cooperation cannot be understated. The values and norms that shape international institutions and state sovereignty are constantly subject to change as global society adapts to new developments (Makinda 1998), but this has an impact on how the UN is perceived, its influence, and how effectively it can operate.

White (2008) describes a tension at the core of the UN as angst regarding loss of sovereignty that is assumed by international cooperation. Makinda (1998) argues that there is a perception among states that the UN erodes the authority of its individual member states. So even though the UN and other international organizations such as the World Bank and World Trade Organization have proliferated since the end of World War II, suggesting acceptance by states of their validity as international players, their increase in powers is often associated with alarm among domestic policy makers who feel their sovereignty is being threatened (White 2008). Nevertheless, the UN’s experience in international dialogue means that it plays a crucial role in determining the sovereign expectations a state should have.

The agenda of the UN is set by the intentions and aims of its members and is subject to a wide array of differing motives, with the most powerful member states able to table more coercive ideas successfully. Historically, the attempted passage

of space legislation that contravenes the interests of the space powers such as the United States or Russia has been ignored. For example, the 1976 Bogotá declaration, signed by several states on the Equator, attempted to assert sovereignty over their respective portions of favorable geosynchronous orbit, but it was widely ignored by more powerful states.

The Bogotá declaration, and the aforementioned Moon Treaty, did not serve the interests of the major space powers and were consequently disregarded. It is clear that international space legislation will not become universally recognized or implemented unless it is supported by the hegemonic space powers such as the United States or Russia. Overall, it is reasonable to assume that any future agreement concerning the property rights of celestial bodies must have the support of the key actors if it is to be implemented universally and successfully.

There is precedent for international agreement concerning space to be created outside of the UN. Hertzfeld and von der Dunk (2005) highlight the case of the International Space Station (ISS), which allows participating states to classify each module of the space station associated to them as “quasi territory” (2005: 88). The agreement between the participant states of the ISS allows for seamless travel for its resident astronauts between modules contributed by numerous states and as Leib (2015) notes allowed states to retain jurisdiction including criminal jurisdiction over their citizens who are in the ISS. But this is a confined agreement with little validity as a template for circumstances outside of and beyond the confines of the ISS.

The UN is the principal international body for cooperation and the maintenance of peace, but the reality is arguably more complex because the role of the hegemonic powers is key to how future dialogue will be shaped. Sommariva (2015) maintains that it is vital the United States remain open to cooperation with other states in creating an international legal and institutional framework for the advancement of the space economy. The role of the United States within the United Nations will be critical, but this opportunity comes at a time when the UN has been relegated

to one of the country’s “fair weather friends” (Mingst 2003: 82). The desire to maintain the full range of sovereign options along with the dominant role of hegemonic influence within the UN and its space agreements are factors for consideration when forecasting the nature of future governance, including property rights on celestial bodies.

THE INTERNATIONAL SEABED AUTHORITY (ISA): AN IDEOLOGICALLY CONTENTIOUS AGENCY IN ITS INFANCY

The International Seabed Authority (ISA) was created in 1994 following international recognition of the need for a supranational form of governance of areas outside traditional zones of state sovereignty, after entry into force of the United Nations Convention on the Law of the Sea (UNCLOS). While it is closely aligned with the United Nations (UN) hierarchy, it is an autonomous international organization (Wood 2008). Nandan (2006) states that the ISA was established to provide vital protection to investors by giving them exclusive rights over seabed areas through ISA contracts or licenses.

This section analyses the ISA model for its applicability and relevance to any future model concerning or regulating the property rights of celestial bodies. The ISA’s principle role is that of supranational administration over mining activities beyond sovereign jurisdiction, so immediate parallels can be drawn with a potential future body to protect the interests of businesses planning to mine celestial bodies. Indeed, Johannsson et al. (2015) argues that the operational structure of the ISA could provide “a viable model for overseeing asteroid mining activities” (2015: 181). But the ideological foundation of the ISA, namely the principle of “Common Heritage,” will be discussed and reviewed for the likely impediment that it might cause in future inter-state dialogues or agreements given contemporary political contexts.

The establishment of the ISA provided a new legal framework in which the seabed is owned as property for all mankind; its ownership and utilization existed outside of the Westphalian state legal system (Brearley 2006). Part XI of

UNCLOS, adopted by UNCLOS III in 1982, was the largest part of the convention, the most contentiously negotiated, and the most relevant to the deep seabed-mining regime, laying the foundation for the ISA (Lodge 2002).

The ISA was established on 16 November 1994 to implement the UNCLOS agreement for the “Area,” meaning the “seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction” (UNCLOS Article 1: 1; Lodge 2002). The ISA remit also included the power to regulate and protect marine ecosystems, coastlines, and the marine environment from hazards and pollution (Chircop 2011). The activities in the Area were described as “all activities of exploration for, and exploitation of, the resources of the Area” (UNCLOS Article 1: 3). This means the role of the ISA was the “organization through which States Parties shall organize and control activities in the Area, particularly with a view to administering the resources of the Area” (UNCLOS Article 157: 1).

The ISA comprises three bodies: the assembly, which is the supreme body, and the one to which the other two bodies—the council, and the legal and technical commission—are accountable (Lodge 2002). The three ISA bodies operate through consensus with decisions taken on a practical and technical basis; this is in contrast to the ideological concerns that marked the initial negotiation of UNCLOS during the cold war (Wood 2008).

Ultimately, the ISA’s primary function is to regulate deep-sea mining, which is mining taking place outside of the 200 nautical mile exclusive economic zone of states (Glasby 2002). The activities that it can regulate include “drilling; dredging; excavation; waste disposal; and construction and operation or maintenance of installations, pipelines, and other devices related to such activities” (UNCLOS Article 157: 1). It should be noted that the ISA does not have jurisdiction over the seabed as a whole. For example, as Brearley (2006) notes, under UNCLOS III, states can lay cables and pipelines on the seabed without the consent of the ISA.

The need for the ISA as a governing body was driven by projections of abundant resources on the sea bed, similar to the profuse projected resources from off-world mining. J. L. Mero in *Mineral Resources of the Sea* (1965) set prospectors’ pulses racing by describing a virtually inexhaustible supply of nickel, copper, cobalt, and manganese on the floor of the Pacific Ocean. Many of these undersea prospectors saw the ocean floor in much the same way as those who claim the existence of huge reserves and profitable opportunities for economic exploitation of scarce and valuable minerals on celestial bodies.

Yet, despite UNCLOS and what Brewer (1985) argues was the openness of financiers to the extraordinary conditions surrounding deep sea mining, the reality of seabed mining seems less likely than ever. Lodge (2002) argues that commercial interest in seabed mining has dwindled to the point where it has now become a remote possibility, and Broadus (1987) contends that the reserves of nickel, copper, cobalt, and manganese, the principal metals that would be mined on the seabed, are more than adequately served by land-based supplies for the foreseeable long term. Deep sea mining has thus not begun in any viable sense. In the absence of commercial interest in deep seabed mineral resources, the role of the ISA has been modest (Keyuan 2010). This also limits the opportunity to analyze examples that could be applied to any possible model for exploiting celestial bodies.

While commercial prospects for future deep sea mining appear slim in the immediate term, the ISA has approved plans for exploration and has entered into 15-year agreements with twenty-six contractors (International Seabed Authority 2017). The authority itself is also authorized to conduct its own mining operations and has full legal personality along with legal immunity (Chircop 2011). The ISA can also contract with private and national companies as long as it is awarded a site of equal size or value (Nagender Nath & Sharma 2000).

THE COMMON HERITAGE PRINCIPLE

What makes the ISA exceptional in regard to international bodies is that its work is guided by the principle of the “Common Heritage of Mankind” (CHM). CHM means that the rights and resources in the area belong to mankind as a whole and are exercised by the ISA on behalf of mankind (Yu & Ji-Lu 2011). CHM is a fundamental principle in the new customary law of the sea arising from UNCLOS (Lihai 1993).

However, a lack of clarity still exists concerning the CHM principle; there are though, commonly agreed features that include “the area is not subject to national sovereignty; all states are to share in the management of the area; benefits from the area are to be distributed evenly; the area is to be used exclusively for peaceful purposes” (Brearley 2006: 51).

Authors such as Glasby (1986) argue that the CHM principle was contentious and caused disagreement among many states. The United States, in particular, found fault with the CHM principle, and the Reagan administration criticized UNCLOS for accepting CHM as a conventional principle of international law. The administration also saw the ISA as complex and unnecessary bureaucracy, while Joyner (1996) argues that American concern over CHM was motivated by the potential for what it perceived as international socialism to be applied to celestial bodies at a later date. Consequently, the United States did not, and so far has not, ratified UNCLOS and is not a member of the ISA.

It is clear that the CHM principle has created division and hindered consensus in regard to international agreements. This was plainly illustrated with the Moon Agreement of 1984 where the inclusion of CHM is blamed by Leib (2015) for creating contention and ultimately playing a key part in the low acceptance rate by states. Although UNCLOS and the Moon Agreement are not directly comparable, both regimes do share similarities because each was designed to implement the concept of CHM.

In examining the ISA much insight is provided to inform a potential model of a celestial body

resource authority. But if the ISA’s key ideological foundation, CHM, has been rejected in treaties covering space, including the Moon agreement, this inevitably raises questions over whether it can be applied beyond the ISA. States party to the Moon Agreement haven’t even begun discussions to create the contemplated international regime it would involve, illustrating its signatories lack of will to fully enact the treaty. While there is much in the ISA model which might be relevant to mining on celestial bodies, incorporating the CHM principle seems certain to cause unease if it is included in future agreements. CHM assigns key preconditions to any possible ownership solutions which could detrimentally influence the success of any agreement on celestial body property rights.

A particularly unique aspect of the ISA’s model, but a potential problem if applied to off-world mining, is the way in which it distributes the revenue it derives from its range of activities. The ISA is required to use the revenues gained to cover (in order of priority), “administrative expenses; equitable distribution between states... with special attention... to the needs of developing countries; funds for the Enterprise; and compensating states affected by market changes due to activities in the Area” (Brearley 2006: 53).

These arrangements illustrate the ISA’s inclination towards practicing social justice. The commitment of the ISA to addressing the needs of developing states applies positive discrimination within the international system. However, this would arguably be unpopular if applied to the space context, considering the vast costs to states and private actors associated with accessing and retrieving mineral resources. The ISA is undoubtedly ambitious in its redistributive remit, but this ambition hinders its applicability, in the modern political context, to acting as a template for an organization administering the property rights of celestial bodies.

The ISA is an organization in its relatively early stages and the practical application of its role has been limited so far, but it undoubtedly has great potential as an organization administering the huge quantities of mineral wealth that are claimed

to lie beneath our oceans. Nandan (2006) argues that since its inception the ISA has established itself as a reliable global institution despite being a modest-sized operation. The powers of commercialization have not challenged the ideological status quo of the deep sea bed regime because it has not been commercially viable to mine these areas. But the ISA's moral principles, if applied to space, may become challenged when subjected to the pressures and expectations of enterprise. Any legal regime developed for property rights on celestial bodies will no doubt be conditioned by the dispute surrounding the CHM principle, which is likely to be a significant conditioning factor.

**THE INTERNATIONAL
TELECOMMUNICATION UNION:
AN EFFECTIVE, IF LACKLUSTER,
INSTITUTION**

This section analyses how successfully the International Telecommunications Union (ITU) engages with and accomplishes its role of administering the most important activity in the contemporary space sector: the allocation of radio frequencies and slots in the geostationary orbit (GEO). The ITU's merits and flaws are critiqued to give an informed perspective on whether it can be a template for creating an international agreement governing the legal framework of property rights on celestial bodies.

The International Telecommunications Union (ITU) was created in 1932 following the merger of the International Telegraph Union, established in 1885, with the signatories to the International Radio Telegraph Convention of 1906 (Cowhey, 1999). The International Telegraph Union was established as part of an agreement between twenty European states that allowed for interoperability between international telegraph networks (Zacher 2002). The primary motive behind the establishment of the International Telegraph Union, and later the ITU, was the need to guarantee the continuous function of communication across borders. While initially only operating in Western Europe, overarching standards covering costs and payment mechanisms allowed for international standards to be set (Shahin 2011).

The ITU is one of the oldest functional purpose international organizations in the world. It is guided by voluntary agreements and became a specialized United Nations (UN) agency in 1947 (Wallenstein 1977). The administrative and diplomatic aspects of the ITU's work are discussed by its member states at plenipotentiary conferences held once every four years. This gives direction to the administrative and policy support work for the institution and its eight hundred Geneva-based staff (Shahin 2011).

The ITU serves to facilitate the seamless communication of information within and across borders. The period preceding the establishment of common standards and a guiding international body was rife with restricted communication networks that would stop at borders due to incompatibility (Shahin 2011). This scenario extrapolates to one where states offer differing methods of recognizing celestial body property rights that are not mutually honored, creating difficult market conditions for all actors.

It has been discussed how domestic legislation, such as by the United States in its Space Act of 2015, set domestic standards that may not correlate with the domestic legislation of other states, creating potentially competing standards. While it is uncommon for the sovereign priorities of states and the internal legal processes of two states to be identical, a certain degree of harmonization is crucial. If left alone, this would inevitably have the effect of restricting the development of off-world resource mining, as differing standards would be likely to inhibit market growth. Many authors argue that the globalization of telecommunications networks and introduction of common standards has enhanced international cooperation and enabled international telecommunications to flourish (Cowhey 1999; Krasner 1991; Ruggie 1975). It is, therefore, reasonable to argue that international cooperation would flourish in a similar manner following the introduction of common standards for off-world property rights.

Parallels can be drawn between motivations for creating seamless function and the setting of universal standards that created the ITU on the one hand, and factors now providing momentum

to create an international agreement on the property rights of celestial bodies allowing for their exploitation. International agreement can create overarching standards. These govern how international and domestic companies offer their goods on a global market and the environment within which private and public actors in states would operate. Just like the establishment of the ITU, these are national issues that require international agreement.

The role the ITU currently plays directly in the space arena is the allocation of radio frequencies and satellite orbital slot positions in geostationary orbit. This is within the ITU's mandate because satellites allow for the optimal expansion of telecommunications services, both nationally and globally (Jakhu 2007). The largest sector of the space industry is currently telecommunication services, characterized by continual expansion and innovation, and worth over \$195 billion (Satellite Industry Association 2014). The ITU thus oversees the largest area of the contemporary space sector.

Radio frequencies and orbital positions are a scarce resource. Indeed, since 1973 the ITU has described them as a "limited natural resource and that they must be used rationally, efficiently and economically" (ITU 2011: 42). Only a finite number of frequency bands and orbital slots can be allocated without potential harmful interference between them. Of course, while radio frequencies or satellite orbital slots cannot be depleted in the same way as fish reserves or minerals, their stock is finite, and this engenders competition for the best slots and frequencies. The importance of the ITU is highlighted by the fact that there are over 1,419 satellites currently orbiting Earth (Union of Concerned Scientists 2017), with each satellite registered with the ITU given a unique orbital position and radio frequency.

Using the ITU as a model or template for establishing property rights in space is therefore limited by the fact that it currently administers activity for a relatively narrow aspect of space utilization. The ITU does serve as a functional example of what can be achieved through international cooperation, but it must be

acknowledged that the area within which it operates is constrained. A future agreement concerning property rights on celestial bodies would need to be more than a direct copy of the ITU's framework because it will apply to a far different and wider arena.

The flexibility that the ITU provides through its operational mandate given directly by member states has, however, led to criticism that it has no enforcement mechanisms. The ITU is made up of member states and has no power to enforce its own regulations over its members. The organization also has no mandate to settle disputes between members and expects that all states should cooperate to find solutions (Jakhu 2007).

This has led to criticism that the ITU is incapable of carrying out its own responsibilities. Cowhey (1999) argues that the ITU has traditionally been characterized as simply a set of technical rules eliciting minimal commitment by its members. Rendleman (2010) concurs that the ITU has been dismissed as a "gentlemen's club" because it is too reliant on the goodwill of its members while Harrison (2013) contends that historically the ITU has acted as an expensive and exclusive club, leading to the maintenance of high standards only because the members had an interest in maintaining decorum. This interest is critical to international agreements, but whether a similar concern would exist in regulating space resources outside of telecommunication interests can only be speculation.

The lowering of entry costs to the space arena has allowed for new actors, and this has put pressure on the ITU. Indeed, the ITU complains that universities and others are launching satellites into orbit without registering them with their relevant national body, and it has no means to sanction the state within which the offending organization is based (Harrison 2013). This is evidence of the problem facing organizations like the ITU that many states will not readily agree to activities that involve the transfer of their jurisdictional control to an international body. Ceding jurisdiction to an international body will only be accomplished if there is a significant benefit to the state. The ITU's practice of allocating radio spectrum and orbital slots on a first come, first served basis

has also led to criticism. A state notifies the ITU of its intention to start a service using certain radio frequencies from a particular orbital position and is then protected against damaging interference from late comers (Lyall & Larson 2016). States seek to gain radio frequencies and orbital positions as they deem appropriate for enhancing their national interest, disregarding the scarcity the ITU bemoans (Jakhu 2007).

ASCENDENCY OF NEOLIBERALISM

The adoption of neoliberal principles denotes a marked shift from state-centric to market-oriented views of communications among the major spacefaring countries. While there are competing definitions of neoliberalism, for the purpose of this article it is assumed to mean political principles and economic activities grounded in the belief that markets should be privatized to serve the public good. The ITU is an influential and leading actor in the governance of contemporary space-based activity; its policies directly affect the ways in which space activity is conducted.

Escobar (1995) argued that its decisions were based disproportionately on the opinions of those in power and that “our knowledge is ideological in the sense that international organisations’ conceptions and means of description represent the world as it is for those who rule it, rather than for those who are ruled” (1995: 108). In the context of globalization, such a view does not appear out of date today, and as Cowhey (1999) also noted, presciently, it was also necessary to acknowledge increasing precedent for free trade rules and the liberalization of the world economy (Cowhey, 1999).

McCormick (2008) argues that the precedent has manifested itself through the space telecommunications sector, with the privatization and restructuring of two of the world’s biggest intergovernmental satellite organizations, Intelsat and Inmarsat. The privatization of Intelsat and Inmarsat represents creeping marketization of the global commons in line with dominant elite ideas concerning the supremacy of neoliberal principles. Creation of a legal regime for the property rights of celestial bodies will most likely put emphasis

on the role of private interests, on the basis that governments tend to see them as essential for driving economic development. The supremacy of neoliberal principles and the dominance of ideas favoring privatization suggest that a model for celestial body property rights based on the ITU would need to favor private interests.

The evolving nature of telecommunications and the emergence of the ITU as a key actor in the contemporary space arena has resulted in what Shahin (2011) argues is the flexible nature of its mandate. The ITU does have clear merit in that it is a functional body, but it also has weaknesses. Its lack of an enforcement mechanism means it can be held hostage to the goodwill of its members. Crucial for any future institution governing the property rights of celestial bodies would be whether it had the enforcement mechanisms to ensure the implementation of its mandate.

CONCLUSION

This article has used empirical examples to examine what a future legal framework governing the property rights of celestial bodies might include. Private enterprises are setting their sights on exploiting what they foresee as limitless space-based resources. In order for this to happen an internationally recognized and agreed legal framework for allocating property rights has to be determined for mining on celestial bodies such as asteroids. The ambitions of private enterprise have put increasing pressure on policy makers to create international treaties that facilitate the appropriation of celestial bodies’ resources through the establishment of property rights.

The most significant existing treaty, the 1967 Outer Space Treaty (OST), guarantees the freedom of space to all states and is widely held not to allow appropriation by private or public actors. Hence, those seeking to mine celestial bodies cannot claim property rights under the current legal framework. State or private enterprises are unlikely to risk investment when there is no regime of mutually respecting contractual obligations and no legal basis giving them property title to anything they mine.

There is disagreement on whether the OST explicitly prohibits individual or private appropriation because the treaty does not provide clarity on the status of the resources contained in celestial bodies, in particular their exploitation and commercial utilization (Leib 2015; McCormick 2015; Hertzfeld & von der Dunk 2005).

However, much scholarly literature, legal commentators, and policy makers favor the argument that the OST does outlaw individual appropriation. Some have suggested circumventing this lack of clarity by classifying asteroids as chattel (Feinman 2014) or applying the accepted definition of “commercial use” within the OST from “use,” which could allow mining (Hobe & Schrogl 2009).

To eliminate such ambiguity, it can be argued that only the establishment of a new legal framework creating a clear and unambiguous property rights regime can create the right conditions for private sector led economic activity in outer space (Johannsson 2015; Tronchetti 2014; Sommariva 2015). As space becomes an increasingly busy arena through growing private involvement, it is vital that international law adapts to contemporary realities without simply seeking to reinterpret the OST, whose principle purpose originally was demilitarization (Hickman 2010).

Since its establishment, the United Nations has been a vital actor in mediating and facilitating peace around the world. While the organization has strong historical precedent for mediation, it suffers from tension among its members regarding a loss of sovereignty that UN involvement is felt to create (White 2008). However, the UN is the body which, through the OST, has provided guardianship over celestial bodies, acting as custodian for mankind as a whole. It would thus seem credible to assume the UN will play a role in their future governance.

Without the support of key actors and spacefaring powers, a universal agreement will not be reached. The impacts of hegemonic influence and fragile perceptions of sovereignty are key conditioning factors in any role the UN may play in facilitating

future negotiations and the likelihood of a practical deal being achieved.

An interesting legal precedent establishing sovereignty in space exists outside of the UN through the legal arrangement created for the International Space Station, but this represents a narrow agreement that is of limited relevance as a template for establishing property rights on celestial bodies. It does highlight that international agreement for space can be cultivated outside of the UN.

The International Telecommunications Union (ITU) and the International Seabed Authority (ISA) are each organizations that offer useful parallels and potential models for any future organization administering the property rights of celestial bodies, but each has notable flaws.

The ISA created a new distinct legal framework because it was based on the principle of the Common Heritage of Mankind (CHM). This manifests operationally through the ISA being authorized to conduct its own mining operations, but private and state companies have to give a site of equal value or size to any of their operations in order to qualify for a license (Nagender Nath & Sharma 2000). The ISA is also required to distribute its revenues to states with a particular focus on developing countries; this aspect of social justice was not welcomed by the United States, concerned that this was a form of international socialism. CHM was included in the ill-fated Moon agreement, and Leib (2015) argues that it was central to its failure. This will undoubtedly lead to tension in future agreements governing celestial bodies and could be a sticking point in negotiations. Ultimately, the CHM principle and the lack of market interest in seabed mining restrict the usefulness of the ISA as a template for any future body governing celestial body property rights.

The ITU administers the largest activity in the space sector, allocating orbital slots and radio frequencies for satellites, each of which is a limited commodity. It involves a voluntary arrangement between states which could be attractive to policy makers keen to maintain flexibility. However, the lack of an enforcement

mechanism does not make treaty obligations any less binding from a legal perspective. The ITU's longevity is evidence of the successful role that states believe it plays, but as a template it has a weakness, which is its lack of an enforcement mechanism. Any future body governing or regulating the property rights of celestial bodies would have to include enforcement mechanisms to allow for the implementation of what it is meant to achieve, otherwise the characterizations of infirmity leveled at the ITU (Jakhu 2007; Cowhey 1999) will be just as valid.

which promises high risk for substantial rewards, is wholly dependent on the development of a comprehensive legal regime that facilitates and encourages it.

The creation of overarching international legislation to establish property rights on celestial bodies arises because while these are national issues, they ultimately require international agreements. Domestic laws such as the US Space Act of 2015 do not create overarching standards for all states to abide by, nor do they create a business friendly trade environment.

International agreements do carry the baggage of domestic concerns and are influenced by dominant ideologies. The dominance of neoliberal ideas within global institutions is likely to affect the outcome of any future agreement regarding off-world property rights. Privatization of two of the largest satellite organizations (Inmarsat and Intelsat) also shows, from the application of neoliberal ideas, the preference favoring private interests in global affairs. This likely presages what can be expected in a regime governing the property rights of celestial bodies, where the interests of the private sector may well take precedence.

The current status quo under which space belongs to everybody and nobody has become unsustainable. The present legal regime offers little support to public and private actors seeking to grow the space industry. A new regime or set of governing principles is desirable to allow the potentially vast resources of the cosmos to be utilized, creating a new space economy which is of direct benefit to mankind. While the ITU and ISA may not provide perfect templates, they do offer beneficial and insightful information on what future legislation may and may not include. Ultimately, the realization of any private sector ambition to mine celestial bodies, a prospect

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Managing Criminalized Power Structures: The Predominant Spoilers of Peace Processes

Michael Dzedzic

Criminalized Power Structures (CPS) exploit illicit wealth acquisition to usurp political power and constitute a leading source of obstruction when the international community intervenes in states struggling to emerge from civil conflict. Structures operating outside domestic or international law may constitute a crucial barrier or spoiler for UN and coalition peace operations. This held true in the post-Cold War interregnum before 9/11 and is likely to continue for stabilization operations, regardless of outcomes from enormous international security investments in Afghanistan and Iraq. By understanding the different types of spoilers acting across cases, the United States and partners in the international community can align their responses so as to manage threats from CPS.

Twenty years ago Stephen Stedman published “Spoiler Problems in Peace Processes,” identifying spoilers as the “greatest source of risk” to successful implementation of peace agreements.¹ This sparked a prolific response in the literature. Most of this scholarship, however, failed to address the intent of Stedman’s article, which was to develop “a typological theory of spoiler management.”² His actual aim was to assist policy makers in “correctly diagnosing the type of spoiler” and then devising appropriate “strategies that will be most effective for particular spoiler types.”³

The number of cases Stedman was able to draw upon in 1997 was limited to Angola, Cambodia, Mozambique, and Rwanda. This restricted the range of strategies available for evaluation. As Stedman noted: “not all combinations of strategy and spoiler type are covered in the cases, given the relatively few cases of spoiler management in the 1990s. For instance, neither coercive diplomacy nor use of force to defeat the spoiler is included.”⁴ Accordingly, he regarded his conclusions as provisional and hoped to inspire further research;

however, as Nilsson and Söderberg Kovacs conclude in their 2011 review of the spoiler literature, “much more research is needed in terms of identifying various strategies for managing already manifest spoilers under different circumstances, a topic that has advanced surprisingly little since Stedman’s (1997) original article...”⁵

The purpose here is to summarize findings and recommendations from recently published research addressing ten cases of peace implementation from 1999-2016. These were featured in *Criminalized Power Structures: The Overlooked Enemies of Peace*, a work devoted to advancing Stedman’s quest for a typological theory of spoiler management.⁶

Findings from three cases are summarized below: Bosnia’s Third Entity Movement (irreconcilable spoiler), Kosovo’s Kosovo Liberation Army (violent opponent with negotiable interests), and Afghanistan’s Criminal Patronage Networks (supporter of the peace process). Salient lessons from the other cases from each type are included in the discussion of the takeaways for that class of spoiler. Our central finding is that strategies used in

¹ Dr. Michael Dzedzic is an adjunct faculty member at George Mason University and former military faculty member of the Department of Political Science, U.S. Air Force Academy. Stephen Stedman, “Spoiler Problems in Peace Processes,” *International Security* Vol. 22, No. 2 (Fall 1997): 5-53.

² Ibid. 6.

³ Ibid.

⁴ Ibid. 20.

⁵ Desirée Nilsson and Mimmi Söderberg Kovacs, “Revisiting an Elusive Concept: A Review of the Debate on Spoilers in Peace Processes,” *International Studies Review* 13 (2011), 622.

⁶ Michael Dzedzic, ed., *Criminalized Power Structures: The Overlooked Enemies of Peace* (Lanham, MD: Rowman and Littlefield, 2016).

the most successful cases aligned with three mutually reinforcing lines of effort involved in conflict transformation (as defined in *Quest for Viable Peace*).⁷ The primary audience for our findings and recommendations is the policy community since we seek to enhance international capacity for spoiler management; however, energizing the scholarly community to respond to Stedman's exhortation for research to advance a typological theory of spoiler management is a closely related intent.

This article provides empirical evidence that criminalized power structures (CPS) constitute perhaps the predominant spoiler threat to peace and stability operations. This thesis builds on the literature on war economies. The Economic Agendas in Civil Wars (EACW) project conducted by the International Peace Academy from 2000-2003 "addressed the critical issue of how the economic agendas of armed factions sustain violent conflict *and inhibit durable peace*" (Italics added).⁸ A 2003 EACW report characterized the phenomenon in the following terms:

Policy analysis has produced important insights on the impact that the predatory and illicit exploitation of natural resources and the pervasive criminalization of economic life can have on conflict dynamics... Both rebel or government combatants who benefited from predation during war may act as 'spoilers', using force to undermine peace processes.⁹

This conceptualization of war economies encompasses several characteristics that are central to the way criminalized power structures are defined here:

⁷ Jock Covey, Michael Dziedzic, and Len Hawley, eds., *Quest for Viable Peace: International Intervention and Strategies for Conflict Transformation* (Washington D.C.: US Institute of Peace, 2005).

⁸ Karen Ballentine, "Program on Economic Agendas in Civil Wars; Principal Research Findings and Policy Recommendations," International Peace Academy, April 2004, 19.

⁹ Heiko Nitzschke, "Transforming War Economies: Challenges for Peacemaking and Peacebuilding," International Peace Academy Conference Report from Wilton Park, October 27-29, 2003, 1.

- Structures built on criminalized political economies do not magically dissolve with the advent of a peace agreement.
- The economic factors conducive to violent conflict and its persistence after a peace agreement include "criminalization of economic life." This term embraces the full spectrum of illicit gray and black market transactions described below.
- Both the state and an armed opposition to it may exploit war economies.

The imperative for addressing war economies is encapsulated by Mats Berdal and Dominik Zaum in *Political Economy of Statebuilding*: "war economies persist into peacetime, and are likely to shape the character of the post-war political economy. Transforming these very political war-time economies is a central challenge for statebuilding operations."¹⁰

CRIMINALIZED POWER STRUCTURES

The nexus between illicit wealth and political power is the central defining characteristic of a criminalized power structure. When ill-gotten wealth plays a decisive role in the competition for and maintenance of political power, the result is an illicit political economy orchestrated by a CPS. Power is typically maintained by violent repression of opposition groups and by dispensing patronage to a privileged clientele group which can lead to criminalization of both the public and private sectors. This tends to produce a zero-sum political economy conducive to conflict, but it may be masked by other cleavages in society (e.g., Rwanda, Bosnia, and Kosovo).¹¹ Criminally

¹⁰ Mats Berdal and Dominik Zaum, eds., *Political Economy of Statebuilding: Power after Peace*, (London and New York: Routledge, 2013), 5.

¹¹ For a discussion of Rwanda, see Bruce Jones, "Military Intervention in Rwanda's 'Two Wars': Partisanship and Indifference," in Barbara Walter and

derived wealth may be a motivation for acquiring power (i.e., greed), or it may be a means used by rebel groups for rectifying group grievances. CPS may either capture the state or constitute an armed opposition to it.

Power structures are criminalized when they are sustained by economic transactions that violate either domestic or international law. A criminalized political economy may operate in two dimensions: the gray and/or the black economy. The gray economy involves commodities that would normally be considered legal; however, the transactions are conducted in illegal ways. This includes evasion of customs duties (i.e., smuggling), avoidance or selective enforcement of regulations, manipulation of exchange rates, violation of economic embargoes, and looting of raw material resources. Cash and material resources of the government may also be siphoned off through misappropriation, procurement kickbacks, stripping of assets from state-owned enterprises, diversion of foreign assistance, and privatization of state assets to cronies at below market prices.

The black economy involves patently illegal commodities typically associated with organized crime. Common activities include trafficking in illicit drugs, people, and weapons (in contravention to an arms embargo), kidnapping, extortion, and money laundering.

One likely contributing factor to the 50% rate of return to conflict within five years after international intervention, as claimed by Kofi Annan, is that by overlooking this spoiler threat and arriving unprepared to deal with it, missions have squandered the “golden hour.”¹² In the cases examined in this project, the average delay in obtaining authorization for essential authorities

Jack Snyder, eds., *Civil Wars, Insecurity, and Intervention* (New York: Columbia University Press, 1999). For Bosnia, see Oscar Vera and Karmen Fields, “Bosnia: Third Entity Movement” in Dziedzic, *Criminalized Power Structures*. For Kosovo, see Covey, et al., *Quest for Viable Peace*.

¹² UN Secretary General Kofi Annan, “In Larger Freedom: Towards Development, Security and Human Rights for All,” Report A/59/2005, March 2005, 8.

and capabilities to mount effective strategies has averaged almost five years. The consequences include allowing CPS to become entrenched, driving down prospects for success (i.e., sustainable peace), and prolonging missions indefinitely.

Since 1990, the UN has intervened in 24 countries struggling to emerge from internal conflict.¹³ One of these, El Salvador, was not seriously bedeviled by a spoiler menace.¹⁴ At least 17 of the remaining 23 cases, or 75%, involved criminalized power structures, including three discrete cases cited by Stedman (i.e., Rwanda, Angola, and Cambodia):

- The ruling Hutu elite in Rwanda, the *akazu*, viewed the Arusha Accords as a threat to their predatory regime causing them to mount a plot to instigate genocide as a result.¹⁵
- Jonas Savimbi, leader of União Nacional para a Independência Total de Angola in Angola (UNITA), was able to reject his loss in the 1992 Angolan elections because, according to Stedman, he “continued to have

¹³ The internal conflicts in which the UN has intervened since 1990 were in the following locations: Afghanistan, Angola, Bosnia /Former Yugoslavia, Burundi, Cambodia, Côte d’Ivoire, Central African Republic, Darfur, Democratic Republic of the Congo, East Timor, El Salvador, Guatemala, Haiti, Iraq, Kosovo, Liberia, Mali, Mozambique, Rwanda, Sierra Leone, Somalia, South Sudan, Sudan/Abyei, Western Sahara. The eight underlined cases are those that case study authors in Dziedzic, *Criminalized Power Structures* determined involved criminalized power structures as spoilers.

¹⁴ The author bases this assertion on his personal observations as a U.S. Air Force attaché in El Salvador during the “armed peace” from 1992-1994.

¹⁵ See David Keen, “The Economic Functions of Violence in Civil Wars,” Adelphi Paper 320, International Institute for Strategic Studies, 1998, 63. “(I)n Rwanda, attempts to end the 1992-94 civil war by creating a democratic government prompted a genocidal backlash from elements of the *Hutu* elite...” See also Bruce D. Jones, “Keeping the Peace, Losing the War: Military Intervention in Rwanda’s ‘Two Wars’,” Colombia University Institute for War and Peace Studies, February 1997, 6. “As negotiations and diplomacy weakened their position, the *akazu* turned increasingly to violence to defend their power.”

uninterrupted sources of revenue through UNITA's control of diamond mines..."¹⁶

- The Khmer Rouge (KR) in Cambodia, Stedman notes, sustained their resistance to the UN Transitional Authority in Cambodia (UNTAC) through "the inflow of arms and petroleum and the outflow of gems and logs, a major source of DK's [KR's] income."¹⁷
- Hun Sen, leader of the State of Cambodia, refused to accept his loss in the 1993 elections and blackmailed UNTAC into a power sharing arrangement. The result, according to Global Witness, has been that both Hun Sen and the Khmer Rouge continued to finance their military activities through illegal logging, and today "the country's most powerful logging syndicate is led by relatives of Prime Minister Hun Sen and other senior officials."¹⁸

Our own research identifies eight discrete cases (i.e., Afghanistan, Bosnia, Democratic Republic of the Congo, Guatemala, Haiti, Iraq, Kosovo, and Sierra Leone). The findings of another volume confirm most of our cases and add Liberia to the list.¹⁹ Evidence assembled by the Enough Project in its study on violent kleptocracies in Africa adds Sudan, South Sudan, Somalia, Burundi, and the Central African Republic.²⁰ This is the basis for

¹⁶ Stedman, 40.

¹⁷ Ibid., 30.

¹⁸ "Cambodia," Global Witness web site, <http://www.globalwitness.org/campaigns/corruption/oil-gas-and-mining/cambodia>, accessed May 31, 2017.

¹⁹ Michelle Hughes and Michael Miklaucic, eds., *Impunity: Countering Illicit Power in War and Transition*, (Washington, DC: Center for Complex Operations, 2016).

²⁰ John Prendergast, "Violent Kleptocracies: How They're Destroying Parts of Africa and How They Can Be Dismantled," Enough Project, October 2016, available at <http://enoughproject.org/reports/violent-kleptocracies-how-theyre-destroying-parts-africa-and-how-they-can-be-dismantled> [May 31, 2017];

"Millions of people have suffered and perished in the ongoing wars in East and Central Africa, including Sudan, South Sudan, Somalia, the Democratic Republic of the Congo, Burundi, Rwanda, Uganda, and the Central African Republic. The big prize in these deadly conflicts is the control of a hijacked state and the natural resource wealth of the country. This

claiming that criminalized power structures are the predominant spoiler threat to peace and stability operations.

SPOILERS

There are several conceptual and typological differences in the approach taken here as compared with Stedman's path-breaking work that need to be made explicit. First, he originally equated spoiling behavior with the use of violence. As Nilsson and Söderberg Kovacs note, "More research, however, ought to be devoted to the non-violent aspects of spoiling behavior...a phenomena we know only little about in spite of its widespread occurrence."²¹ This certainly applies to criminalized power structures, and this project has examined both violent and non-violent forms of obstruction to peace implementation.

Second, the above revision of the spoiler definition has implications for the typology that should be used to guide the strategic response. Clearly, strategies must be tailored to whether violent or non-violent means are employed. Stedman's spoiler typology was based on *the nature of spoiler's intentions* (i.e., total, greedy, or limited).²² A more useful approach is to distinguish among types of CPS according to their *relationship to the peace process*.

One of these distinctions must be whether they use violent or non-violent means to oppose the peace process. Additionally, Stedman's categories of intentions can be collapsed into whether their interests are negotiable (i.e. greedy) or irreconcilable (i.e., total). Stedman's limited spoilers, as he defines them, could fall into either of the above categories. Finally, CPS can be classified according to whether they support or oppose the peace process.

Perhaps the central conceptual innovation of this work is to propose that a CPS can have a profound

enables mass looting of state resources and diverting state budgets into military and security spending to perpetrate wars and to maintain power by any means necessary."

²¹ Nilsson and Söderberg Kovacs, 617.

²² Stedman, 9-11.

spoiling effect even if it does not overtly oppose the peace process. The kleptocratic nature of a CPS can produce a crippling loss of legitimacy or a hollowing out of the state's capacity to perform essential functions (e.g., security). The administrations of Hamid Karzai in Afghanistan and Nouri al Maliki in Iraq provide salient examples of this. Accordingly, the examination of the empirical record of the international community's efforts to deal with CPS in *Criminalized Power Structures: The Overlooked Enemies of Peace* is organized around these three discrete types:

- Irreconcilable Adversaries (oppose peace process, use violence, irreconcilable interests)
- Violent Opponents with Negotiable Interests (oppose peace process, use violence, negotiable interests)
- Supporters of the Peace Process (support peace process, do not use violence, negotiable interests)

The spoiler's relationship to the peace process also provides a handy *yardstick for determining whether the strategies adopted have been successful or not* by measuring their ability or propensity to spoil the peace process. Success is defined as eliminating the risk that CPS posed to peace and stability. To determine whether the strategy adopted by the mission made progress in "subduing" a given CPS, we compare the type at the inception of the intervention with the type it was when the case study was completed.

Progress has been made with irreconcilables if they have been neutralized or if they have been compelled to negotiate. For a violent CPS with negotiable interests, cessation of the use of violence or opposition to the peace process indicates success. For supporters of the peace process, a reduction of illicit activities to the point that they no longer constitute a threat to domestic stability or allow the CPS to perpetuate itself in power through illegitimate means constitutes success. If no CPS existed prior to the intervention, their emergence as a threat to the peace process without an effective strategic response is a hallmark of failure.

The purpose here is not to measure the success of the overall intervention but rather to assess whether spoiling activity was effectively reduced or ended so it no longer threatened the peace implementation process. The focus of analysis was to identify the common denominators of success of strategies used to confront each type of CPS. The methodology used was structured, focused comparison. This is the same methodology adopted by Stedman.

We examined the following ten cases:

Irreconcilable Adversaries

Bosnia: Third Entity Movement; Guatemala: Illegal Entities and Clandestine Security Apparatus; Sierra Leone: Revolutionary United Front; Haiti: Gangs of Cité Soleil

Violent Opponents with Negotiable Interests

Kosovo: Kosovo Liberation Army; Democratic Republic of the Congo: M-23; Iraq: Jaish Al-Mahdi

Supporters of the Peace Process

Colombia: Paramilitaries; Afghanistan: Criminal Patronage Networks; Iraq: Nouri al-Maliki

Considerations involved in selecting these cases were the types of CPS involved (a minimum of three cases was required for each type so that generalizations could be drawn); a range of successes, partial successes, and failures; a mix of both states and insurgencies as CPS; and geographic diversity. Findings from the Bosnia, Kosovo, and Afghanistan cases are summarized, below, along with a recapitulation of the general findings from all other cases for each of these types.

IRRECONCILABLE ADVERSARIES: BOSNIA'S THIRD ENTITY MOVEMENT

The Bosnia case is distinguished by the unequivocal success of the strategy that was eventually implemented to prevent the Third Entity Movement from scuttling the Dayton peace process. On the other hand, it is typical of other cases involving irreconcilables in that the grave threat they posed was neglected for years. Case

study authors Oscar Vera and Karmen Fields make clear that a simplistic diagnosis of the cause of the conflict obscured a profound and fateful reality:

The conventional interpretation of the conflict as exclusively ethnic obscured the role of the country's criminalized power structures in provoking the war and then perversely collaborating with their counterparts across ethnic lines to profit from it. Owing to this blind spot..., the ensuing peace settlement failed to come to grips with the destabilizing impact of Bosnia's illicit political economy.²³

Owing to this ignorance about the threat from Bosnia's three "parallel power structures," there were no provisions in the Dayton Peace Accords to deal with their covert and sometimes violent obstructionism. International police were unarmed and empowered merely to mentor, monitor, and train. The other components of the legal system were ignored. This meant that Bosnia's CPS were effectively left to judge themselves. Although the NATO-led Implementation Force (IFOR) enjoyed a robust mandate, it was focused exclusively on a narrowly defined threat from the formal military forces of the protagonists. When violent resistance mounted, often in the form of "rent-a-mobs," IFOR branded appeals for their involvement as "mission creep." It took several years before it would recognize that Bosnia's criminalized parallel power structures were the center of gravity for stabilizing the conflict.

The Third Entity Movement contravened one of the red lines of the Dayton Agreement since it aspired to dissolve the Bosniak-Croat Federation and create an entity co-equal with the Serbs and Bosniaks. This would have been a potentially irreversible step toward unification with Croatia, which would have rendered the survival of the Bosniak rump state untenable. The result would almost certainly have been a return to conflict. The only suitable strategic goal was to prevent this non-negotiable project.

²³ Oscar Vera and Karmen Fields, "Bosnia: The Third Entity Movement." in Dziedzic, *Criminalized Power Structures*, 30.

Croatian President Franjo Tudjman was the driving force behind the Third Entity Movement, and he continued to pursue this ambition assiduously until he died in 1999. The clandestine elements of this CPS included a nexus between the Croatian Intelligence Service and its counterpart in Herzeg-Bosna. There was also a stay-behind unit of the Croatian Army that was converted into the Monitor M Company to avoid complying with the Dayton requirement that all Bosnian Croat military units be placed under Federation command. Other informal elements were the Convict Battalion that had perpetrated notorious acts of ethnic cleansing during the conflict and the Renner Transportation Company that was a cover for arms trafficking and other transnational crime and the perpetrator of violent confrontations with Moslem returnees.

One of the primary sources of illicit revenue for the Third Entity Movement stemmed from Tudjman's diversion of proceeds from the sale of Croatian state assets into the Hercegovacka Bank in Mostar that had been established by the Monitor M Company. From 1998 to 2000, \$180 million a year was channeled into the bank. The head of Monitor M, "former" Croatian Army General Ante Jelavic, used these secret funds to capture the Bosnian Croat vote in the 1998 Bosnian general elections and become the Bosnian Croat member of the state-level tri-presidency. Smuggling was another massive source of revenue, and the Renner Transport Company was central to this.

Among the debilitating flaws in the international strategy was a requirement to conduct elections in a year. This unseemly haste to turn ownership over to local authorities profoundly exacerbated the ability of Bosnia's three CPS to obstruct reform efforts because they gained a façade of democratic legitimacy after the elections. Another flawed component of the strategy was "relying on institutions and leaders in the Federation and the RS to arrest war criminals and investigate and prosecute corruption, organized crime, and domestic terrorism."²⁴ It took two years of ineptitude before the Peace Implementation

²⁴ Ibid., 37-8.

Council (PIC), an international body created to oversee implementation of the Dayton Peace Accords, sought to correct the impotence of the civilian head of the mission, the High Representative. In 1997 the PIC granted the High Representative authority to cashier government officials who obstructed Dayton along with the power to bring reforms that local politicians refused to enact into effect via decree (i.e., the Bonn powers). Simultaneously, SFOR (IFOR's successor) was having an epiphany about the root cause of the conflict actually residing in Bosnia's political-criminal power structures, causing it to shed IFOR's contemptuous attitude about anything that smacked of policing. The deployment to SFOR of a Multinational Specialized Unit of "gendarme-like" forces with expertise in use of non-lethal force for crowd and riot control took place in 1998.

To lay the foundation for action against the Third Entity Movement required use of the Bonn powers to impose a witness protection law; amend the Federation Supreme Court Law to make it the court of first instance for cases involving terrorism, drug trafficking, inter-Cantonal crimes, and organized crime; and create the Federation Prosecutor's Office to try these cases. Personnel working in these institutions were vetted by the international community to assure an honest judicial system. A special unit of the Federation police was vetted and trained to apprehend suspects.

Once the means had been put in place, the military and civilian components of the international community carefully coordinated intelligence-led operations among themselves and trusted members of the Bosnian community. The first operation targeted the Renner Transport Company. As the Federation Police were attempting to launch the operation, it was leaked and the suspects fled; however, this exposed linkages between organized crime, the Cantonal Police, and the Bosnian-Croat intelligence service (National Security Service [SNS]).

This led SFOR to launch Operation WESTAR in October 1999 against the SNS. This was an unmitigated success resulting in confiscation of forty-two computers laden with information about

illicit money-making schemes and espionage against virtually the entire international community. After assessing this trove of data, SFOR discovered that the Croatian Intelligence Service and SNS were working together and that Croatia was sending money to support the Third Entity Movement through the Monitor M Company.

This led to the discovery of their Achilles heel: the Herzegovacka Bank and the flow of illicit revenues from Croatia. With support from SFOR and the Federation Ministry of Interior and Financial Police, the High Representative mounted an operation to take control of the bank seizing sufficient evidence to mount twenty criminal investigations including eventual charges against Jelavic.

Vera and Fields sum up the results as follows: "(T)he Movement was dealt a fatal blow and violent resistance to Dayton from Herzeg-Bosna was ended."²⁵ Unfortunately for the prospects for stabilization in the rest of Bosnia, however, informal political-criminal structures continue to hold sway in the Bosniak and Serbian polities. Vera and Fields conclude with this trenchant analysis: "(I)f the international community had begun the intervention in Bosnia with a basic understanding of the illicit, parallel structures in power in each ethnic community, coupled with the authority that was eventually granted at Bonn-Petersburg and the will to use it to hold the elites at the top of these structures accountable, the odds are that Bosnia would not be a dysfunctional state today."²⁶

LESSONS FOR IRRECONCILABLE CPS

- Failure to assess the CPS threat properly is likely to place the mission in grave jeopardy.

The interventions in Bosnia, as well as in Haiti confronting the gangs of Cité Soleil and in Sierra Leone dealing with the Revolutionary United Front (RUF), all nearly collapsed owing to the failure to recognize the existential threat that CPS

²⁵ Ibid., 44.

²⁶ Ibid., 48.

constituted.²⁷ One salient lesson is that the attainment of a peace agreement does not equate to a “post-conflict” environment. Planning should accordingly be based on worst-case assumptions about threats to the peace process. Another lesson is that it is folly to dismiss the CPS threat as just a “criminal” problem and not a concern for the military contingent as occurred in Bosnia and Haiti.

- An effective way to deal with irreconcilable CPS is use of superior force in a proactive and coordinated manner by both military and police contingents.

Once it is clear that the mission is confronting an irreconcilable spoiler, the appropriate aim is to dismantle and defeat it, preferably through arrest and prosecution. Ironically, international interventions have achieved their highest degree of success in these cases—after initially courting disaster. CPS threats in Bosnia and Sierra Leone are the only cases we examined that were eliminated, and both involved proactive use of superior force by a robust military and police contingent.

- Depriving CPS of access to illicit revenue is an effective way to defeat them.

Essential to success in Bosnia was taking control of the Herzegovacka Bank that had been the source of illicit funds for the Third Entity Movement. In Sierra Leone the mission mounted operations to retake the diamond mines from the RUF, their operational center of gravity.²⁸

- Use of intelligence-led operations is an essential means.

Intelligence was a critical enabler for the operations mounted in Bosnia, Sierra Leone, and Haiti.

²⁷ See David Beer, “Haiti: The Gangs of Cité Soleil,” and Ismail Rashid, “Sierra Leone: The Revolutionary United Front,” in Dziedzic, *Criminalized Power Structures*.

²⁸ See Ismail Rashid, “Sierra Leone: The Revolutionary United Front,” in Dziedzic, *Criminalized Power Structures*.

- The mission must ensure that the entire legal continuum—from intelligence to incarceration—is able to function.

In Haiti, the Joint Mission Analysis Center collected critical tactical intelligence, but to use this intelligence required a SWAT team to conduct high risk arrests. In Bosnia, this specialized policing capability was provided by IFOR’s Multinational Specialized Units. The most difficult gap in this continuum to fill, however, has been to prosecute and convict CPS members (See below).

- Allowing CPS ownership over the legal system is not the way to end impunity.

In Bosnia and Guatemala (which confronted a spoiler threat from a Clandestine Security Apparatus), CPS initially retained their influence over the legal system in spite of the extraordinary courage of individual judges, prosecutors, and police.²⁹ Only after the international community was empowered to play a direct role in the legal system was the CPS spoiler threat tamed.

- For peace to be sustainable, the capacity of local institutions to combat impunity through the rule of law, transparency, and accountability is essential.

The success in Sierra Leone has been sustained by reform of the police, army, and intelligence service with emphasis on accountability and civilian control. In contrast, the UN Stabilization Mission in Haiti suffered a two-year delay in being provided a mandate to develop the rule of law. Coupled with this has been the failure to establish an effective accountability regime for the Haitian National Police to deal with the risk of politicization and criminalization of the country’s only security force.

²⁹ Carlos Castresana, “Guatemala: Illegal Entities and the Clandestine Security Apparatus,” in Dziedzic, *Criminalized Power Structures*.

**VIOLENT OPPONENTS BUT NEGOTIABLE INTERESTS:
KOSOVO LIBERATION ARMY**

Even though the conflict in Kosovo was self-evidently driven by a dispute between Albanian and Serb communities over who should exercise sovereignty, the Kosovo Force (KFOR) did not anticipate that its forces would face a greater security challenge from violence against the Serbs by extremist elements of the Kosovo Liberation Army (KLA) than from armed resistance by Serb forces. Also overlooked was the less apparent but no less vicious struggle within Kosovo's Albanian community between the KLA and followers of pacifist Ibrahim Rugova to fill the power vacuum created by the withdrawal of Serb forces. The instrument used in this case was an assassination campaign against Rugova's supporters by the KLA's National Intelligence Service (SHIK) that subsequently transferred its allegiance to the Democratic Party of Kosovo (PDK), one of several political parties formed by former KLA leaders.

In spite of its executive mandate, the UN Mission in Kosovo (UNMIK) decided initially to rely totally on the local judiciary, which effectively meant use of Albanian judges, owing to the inordinate risks Serb judges confronted. Within a year the ensuing injustice meted out to Serbs and the total impunity enjoyed by former KLA members compelled UNMIK to introduce international judges and prosecutors into Kosovo's legal system. The mission's other critical blind spot was the fixation on the formal economy to the neglect of the need for effective corporate governance structures to prevent the illicit capture of revenue from publicly owned enterprises, one third of Kosovo's economy.

The litany of risks engendered by the failure to recognize violent extremist elements within the KLA as a CPS includes attempted ethnic cleansing; use of clandestine intelligence apparatchiks to eliminate political competitors; a void in the rule of law; and the capture of a sizeable segment of the economy that was accounted for by publicly owned enterprises. The golden hour was lost, and it took several years to cobble together capabilities required to complete

the "intelligence-to-incarceration" continuum needed to deal with violent obstructionism.

In spite of UNMIK's initial shortcomings, the mission did quickly establish that the KLA's interests were negotiable. The signing of the "Undertaking" less than a month after the inception of the mission obligated the KLA to demilitarize and transform itself into an unarmed civil defense force. This was a crucial step in affording the KLA an alternative to the use of violence to pursue their unsatisfied war aims.

Owing to his prior experience with CPS in Bosnia, UNMIK Principle Deputy Jock Covey established the mission's way to deal with violent extremists: *support those who support the peace process and oppose those who oppose it.* For KLA extremists and their Serb counterparts, the so-called Bridgewatchers, "peace" was but the perpetuation of conflict through other violent means. These sources of continuing instability had to be confronted, and the cost of violent obstructionism had to be rendered prohibitive.

Simultaneously across all of UNMIK's lines of effort (political, security, rule of law, and economic), this "stick" was matched with a parallel effort to establish more attractive peaceful and licit alternatives for the competition over power and wealth. Eventually this overarching strategy was branded "conflict transformation."

As defined in *Quest for Viable Peace*, conflict transformation "entails diminishing the means and motivations for violent conflict while developing more attractive, peaceful alternatives for the competitive pursuit of political and economic aspirations."³⁰ This strategy consists of three reinforcing components:

- *Shape the context* by dismantling or disrupting spoiler networks so as to neutralize their ability to thwart the peace process.

This is not a task indigenous institutions can be expected to discharge. The mission must come prepared to confront the CPS threat itself;

³⁰ Covey, et al., *Quest for Viable Peace*, 14.

otherwise the golden hour will be squandered and the mission may be placed in jeopardy. This step is typically neglected, however, in favor of simply developing institutional capacity and transitioning to national ownership. In the presence of CPS with a high degree of overlap between criminal and political power, failing to shape the context first is a fatally flawed strategy.

There are potentially replicable principles in the way UNMIK implemented this strategy. First, since it had to rely heavily on KFOR initially, these two entities needed to establish collaborative civil-police-military decision making and planning mechanisms. Second, at the heart of the strategy was the conduct of joint military and police intelligence-led operations to strike against militant extremists. Third, confronting the impunity of CPS requires the deployment of the full continuum of rule of law capabilities from intelligence to incarceration, and internationals need to arrive prepared to take the lead. Finally, the center of gravity of the economic strategy is to deprive violent obstructionists of their sources of illicit revenue.

- *Develop institutional capacity* to resolve disputes peacefully and generate wealth through legal means.

Peaceful alternatives include free and fair elections; respect for minority rights; monopoly of force by the state coupled with a mentality of service; rule of law with the capacity to hold the most powerful accountable; and an enabling environment for a market-based economy.

- *Nurture safeguards on the exercise of power* to ensure that the institutional capacities being developed, especially the security apparatus and judicial system, do not again become instruments of persecution of the opposition, that public revenue generation and expenditure are not captured by political-criminal networks, and that illicit revenue does not determine who governs.

Essential for this purpose are the capacities to observe governmental performance (transparency)

and punish misconduct (accountability). Processes linked to the state, such as competitive elections that permit alternation in power, an autonomous judiciary, and independent oversight mechanisms for the security sector, are necessary but not sufficient. A vibrant civil society is also required, including a free press; non-governmental organizations dedicated to exposing corruption and shielding whistle blowers; and an independent intellectual community.

The conflict transformation strategy implemented by UNMIK and KFOR has largely been a success but with a caveat. KLA extremists indeed ceased the use of violence against the Serb community, their domestic political opponents, and neighboring states with contiguous Albanian populations.³¹ The April 19, 2013 normalization agreement with Serbia effectively guarantees that remaining issues in the relationship will be resolved through peaceful processes. The international political and security strategies, therefore, can be acclaimed as resounding successes.

The caveat, however, is that the strategies to curb the impunity of former KLA leaders and prevent capture of the state by those bent on exploiting it for political and personal gain are seriously lacking. As a 2011 Clingendael report sums up, “The current dynamics of governance in Kosovo point to a concentration of power in the hands of the ruling PDK and its supporters, who are accused of links to networks of corruption and other criminal activities.”³²

LESSONS FOR VIOLENT CPS WITH NEGOTIABLE INTERESTS

- Conflict transformation is an effective way to deal with violent opponents of the peace process who have negotiable interests.

³¹ With the exception of a brief incident in Kumanovo, Macedonia in May 2015.

³² Ivan Briscoe and Megan Price, “Kosovo’s New Map of Power: Governance and Crime in the Wake of Independence,” Netherlands Institute of International Relations (Clingendael), May 2011, 4.

Conflict transformation entails shaping the peace implementation context by dealing assertively with violent spoilers while providing more attractive peaceful alternatives for pursuit of wealth and power. KFOR provided essential military support to UNMIK, which eventually fielded the capabilities needed to complete the “intelligence-to-incarceration” continuum and confront the KLA’s violent obstructionism through the legal system.

Both the Kosovo and Iraq cases (the latter involving Jaish al-Mahdi) achieved a high degree of success by imposing dissuasive costs for the use of violence in tandem with providing the opportunity to compete for power peacefully in the electoral process.³³ The final component of a conflict transformation strategy, establishing safeguards on the performance of core institutions (e.g., the security sector, legal system, revenue generation and expenditure, electoral process) was the weakest link in both Kosovo and Iraq.

- Addressing the sources of illicit revenue should be a principal way of confronting a violent CPS with negotiable interests.

All three cases examined in this project failed to make this a priority initially—to the detriment of the peace or stabilization process. In Kosovo, after failing to prevent the KLA from asserting control over publicly owned enterprises that constituted one-third of Kosovo’s economy, UNMIK belatedly mounted a concerted effort to establish accountable corporate governance structures. The lack of any mandate for the UN missions in the Democratic Republic of the Congo (DRC) to confront the looting of the eastern DRC’s resources explains the persistence of that conflict after nearly two decades.³⁴ The lesson that should be etched indelibly into future planning is that a flourishing illicit political economy should be recognized as a primary threat to stabilization.

³³ Phil Williams and Dan Bisbee, “Iraq: Jaish al-Mahdi and the Sadr Movement,” in Dziedzic, *Criminalized Power Structures*.

³⁴ Jana Nyerges, “Democratic Republic of the Congo: M-23,” in Dziedzic, *Criminalized Power Structures*.

- Turning ownership of the legal system over to domestic judges is a counterproductive way to deal with CPS who are violent obstructionists.

UNMK had to reverse its decision to place the legal system in the hands of Kosovar judges because it resulted in impunity for KLA extremists engaged in ethnic cleansing against Serbs and assassinating their Kosovo Albanian political rivals.

- Capacity building should be accompanied by strategies to combat capture by CPS.

One of the principles that should be borrowed from the development community is “Do no harm.” In an environment where CPS are present and vast sums of assistance are being expended, there is a real possibility that a substantial percentage will flow into the wrong hands. One essential remedy is to immediately emphasize standing up transparency and accountability mechanisms for the local institutions under development. This is especially vital for the security forces and intelligence apparatus since they are liable to be subjected to pressure for both politicization and criminalization.

SUPPORTERS OF THE PEACE PROCESS: AFGHANISTAN’S CRIMINAL PATRONAGE NETWORKS

Case study authors Carl Forsberg and Tim Sullivan cite a description of the criminal patronage networks (CPN) permeating the Afghan government by Hamid Karzai’s National Security Advisor Rangin Dadfar Spanta in 2010 that “begin with the financial banking system, with corruption networks, with reconstruction and security firms and also with drugs and the Taliban; they are in Parliament and they are in government.”³⁵ As the authors make clear, there was nothing traditional about Afghanistan’s criminal patronage networks.

The origins can be traced to mujahedeen resistance to the Soviet intervention from 1979-89.

³⁵ Matthew Rosenberg, “Malign Afghans Targeted,” *Wall Street Journal*, December 29, 2010.

What began as a multi-ethnic opposition movement became polarized into competing ethnic camps in the wake of the Soviet withdrawal. The rivalry between the largely Pashtun Hezb-e Islami and the Tajik Jamiat-e Islami precipitated Afghanistan's 1992-1996 civil war. The consequence was the emergence of the Taliban and their dominance of most of Afghanistan after 1996, until the US responded to the 9/11 attacks that emanated from Afghan soil.

The ensuing 2001 Bonn Conference, which serves in this case as the functional equivalent of a peace agreement, perversely became a prescription for criminalization of the state. In the estimation of the authors, "Corruption in Afghanistan reached crippling levels as a result of the character of the country's post-2001 political settlement, which was built on the distribution of political power between factions formed during the country's civil war."³⁶

One of the outcomes of Bonn was to concede the defense and interior ministries to the Tajik party under Mohammad Fahim, which, the authors note, was a result of having occupied Kabul with his militias. Thus Karzai, who was designated as interim president by the Bonn Conference, was dealt a very weak hand. The only trump card that he might have played—U.S. support for constraining Fahim—was not forthcoming. Indeed, the Bush administration encouraged accommodation with Afghanistan's regional potentates.

As a result, there were no consequences for wholesale abuse of power and looting of state resources, which soon included siphoning off customs revenue, misappropriating international assistance, protecting heroin traffickers, and exploiting financial institutions for personal gain. Emblematic of the kleptocratic political economy that resulted was the collapse of Kabul Bank in 2010, which required a bailout equating to more than 5% of the country's GNP. According to Forsberg and Sullivan, "Under the influence of the Fahim family, Afghanistan's largest bank had, in

³⁶ Carl Forsberg and Tim Sullivan, "Afghanistan: Criminal Patronage Networks," in Dziedzic, *Criminalized Power Structures*, 275.

essence, become an instrument of patronage employed by the ruling elites."³⁷

In a speech in 2002 Karzai effectively conferred impunity on CPN stating, "Justice becomes a luxury for now."³⁸ Even after winning election as President in 2004 and again in 2009, however, Karzai continued "a strategy of balancing, dividing, and co-opting—rather than confronting—Afghanistan's fractious strongmen and their clients."³⁹ Rather than being a temporary expedient, impunity for members of Karzai's CPN coalition was central to the illicit political economy upon which his regime was founded.

The United States neglected the menace posed by Afghanistan's CPN for years. Indeed, the authors note, "U.S. policy often exacerbated the problem by using regional strongmen and their CPNs as proxies in operations against al-Qaeda and Taliban fighters."⁴⁰ In 2003, when internecine violence among competing regional militia commanders posed a threat to stability, the United States adopted a "warlord strategy" involving coercive measures to compel disarmament of militias combined with co-optation of commanders into the central government.

Rather than diminishing the CPN threat, however, this strategy merely traded off a non-institutionalized renunciation of violence among themselves by these warlords for an expansion of the number of CPN divvying up governmental largesse. Demobilization of militia forces often resulted in rebranding their followers as police, endowing them with the legitimacy of the state to engage in predatory and criminal practices. In the assessment of Forsberg and Sullivan, "Violent conflict between armed militias and overt factionalism was sublimated into competition for state office, patronage, and wealth. Although intimidation remained omnipresent in both the public and private sectors, money replaced guns

³⁷ Ibid., 283.

³⁸ BBC News, "Karzai Sets Out Afghanistan Vision," June 14, 2002.

³⁹ Forsberg and Sullivan, "Afghanistan: Criminal Patronage Networks," 280.

⁴⁰ Ibid., 285.

as the leading source of political influence.”⁴¹ The consequence was to divert the focus of government away from responding to the needs of the population, thereby sapping it of legitimacy and public support against the Taliban insurgency. The authors call attention to “the connection between the Taliban’s reemergence after 2003 and the abuse of power by government officials, security forces, and their networks of affiliates.”⁴²

The strategy undertaken by the international community starting in 2002 focused primarily on capacity-building. This included massive resources allocated to the Afghan National Security Forces (ANSF), comprised of both the army and police. This strategy foundered, however, because “technical assistance and capacity-building alone, absent measures to counter the influence of CPN, could do little to prevent the growing dysfunction of Afghanistan’s state institutions.”⁴³

To confront the crippling impact of CPN required depriving them of impunity, but this did not become a focus for U.S. policy until 2007. At first this “prosecutorial approach” relied upon the Afghan Attorney General’s office, with the result that the principal targets for prosecution were Karzai’s own political rivals and media critics. The U.S. coordinator for this initiative, Thomas Schweich, resigned in 2008, publishing an article that characterized Afghanistan as a narco-state in which the Karzai government protected a class of criminal elites.⁴⁴

In 2009 a new entity for prosecution of political criminals, the Major Crimes Task Force (MCTF), was launched under the tutelage of the FBI with the intention of shielding it from political interference. After some initial successes, however, this initiative was neutralized by Karzai after the MCTF arrested Amad Zia Salehi, “a key palace insider who moved money to facilitate

Karzai’s political agenda and was on the payroll of the CIA.”⁴⁵

In 2010, the NATO-led International Security Assistance Force (ISAF) designated CPN as a strategic threat and sought to counter them by creating a task force that stressed accountability as an essential component of Afghan security force development. ISAF fostered this through creation of oversight mechanisms to investigate and sanction criminal misconduct. Among the most effective countermeasures were international intelligence sharing and coordinated action by international law enforcement against key CPN members. International financial sanctions were another mechanism used. The authors conclude that such international action “became a critical way to degrade Afghanistan’s criminal networks, creating a deterrent effect that the Afghan judicial system was incapable of achieving.”⁴⁶

In evaluating the effectiveness of an international strategy, we begin by considering what type of CPS was present when the international community intervened. In Afghanistan, unless we count the Taliban, there was no legacy of CPS governance. The Afghan experience provides a surefire formula for failure: overlook the prospect that CPS are capable of emerging in the presence of a power vacuum, then wait for years to confront impunity until CPS have entrenched themselves in power because they are regarded as supporters.

To succeed, the international community must come prepared to create dissuasive consequences for CPS exploiting their capacity for intimidation to capture state functions. This requires the means to promptly monitor and constrict illicit financial flows, impose costs such as international law enforcement actions, and establish mechanisms for transparency and accountability.

Prospects for change exist in Afghanistan owing to the election of reformer Ashraf Ghani as president, but patronage networks are deeply embedded. Lacking in Afghanistan are durable institutions to mediate the contest for wealth and

⁴¹ Ibid., 280.

⁴² Ibid., 293-4.

⁴³ Ibid., 287.

⁴⁴ Thomas Schweich, “Is Afghanistan a Narco-State,” *New York Times Magazine*, July 27, 2008.

⁴⁵ Ibid., 288.

⁴⁶ Ibid.

power, governmental legitimacy, and popular support that are essential to prevail over the Taliban.

Even though Karzai and various warlords either supported or were co-opted into supporting the Bonn Settlement, their criminal patronage networks became a ruinous barrier to stabilization against a Taliban insurgency that could more credibly claim to offer justice and an end to impunity. In sum, in spite of the recent emergence of hope for progress, the strategy implemented in Afghanistan until 2016 when this case was assessed can only be categorized as a failure because it ushered in the criminal patronage network phenomenon that delegitimized the government and severely encumbered the campaign against the Taliban.

LESSONS FOR CPS THAT SUPPORT THE PEACE PROCESS

- CPS that are supporters of the peace process have produced the worst outcomes.

The criminal patronage networks that were spawned under the Karzai administration drained it of legitimacy thereby vitiating international efforts to defeat the Taliban. As had been the case in Bosnia and Haiti, for years in Afghanistan the military dismissed the CPS threat as a distraction from their mission. The strategy implemented to deal with the Nouri al-Maliki regime in Iraq also failed spectacularly. In addition to governing in a sectarian manner that alienated the Sunni population, Maliki's pervasive network of patronage hollowed out the combat capability of the Iraqi Army to such an extent that it collapsed in the face of an offensive by the Islamic State in June 2014.⁴⁷

- The most effective antidote for a spoiler in disguise that supports the peace process is functioning institutions of transparency and accountability.

⁴⁷ Dan Bisbee, "Iraq: The Rise, Fall and Persistence of the Maliki Regime," in Dziedzic, *Criminalized Power Structures*.

Our Colombia case attributes the success attained there against the hidden, symbiotic relationship between the paramilitaries and the Uribe government primarily to the Colombian media that exposed government complicity in paramilitary crimes as well as the legal system and electoral process that held officials responsible.⁴⁸ These are not common attributes, however, of most political systems that are struggling to emerge from conflict.

Failures in Afghanistan and Iraq can be attributed to the inability of international peace and stabilization missions to hold the Maliki and Karzai governments accountable for the debilitating consequences of corruption on corroding state capacity and legitimacy. This strongly indicates that the international community should place its emphasis on developing accountability mechanisms when confronted with a spoiler that is also a supporter of the peace process.

CONCLUSIONS

The overall success rate for the ten cases treated in *Criminalized Power Structures: The Overlooked Enemies of Peace* is summarized below (Table I). This is not a statement about the success of the overall intervention but an assessment of whether spoiling activity by the party to the peace agreement examined in the case study was effectively reduced or ended.

Surprisingly the highest rate of success has been achieved in dealing with irreconcilables; however, this has only resulted after the missions were either brought to the brink of calamity by failure to recognize the CPS menace (Bosnia, Haiti, and Sierra Leone) or the threat was allowed to metamorphose into a nearly intractable challenge (Guatemala). Our second category, violent opponents with negotiable interests, produced a mixture of success and partial success, but this came only after lengthy and costly delays. The record in dealing with supporters of the peace process has been the least successful, with two failures: Iraq-Maliki and Afghanistan. The success

⁴⁸ Jennifer S. Holmes, "Colombia: Paramilitaries," in Dziedzic, *Criminalized Power Structures*.

in Colombia, moreover, was attributable not to the international strategy but rather to the prevailing strength of the indigenous media and court system that exposed and effectively confronted the CPS network that had infiltrated the government. All of this reinforces the point that the international community has suffered from a persistent blind spot to the potential for CPS to pose a severe spoiler threat.

This abbreviated review of the empirical record summarizes the data we collected as we sought to advance Stedman's quest for a typological theory of spoiler management.⁴⁹ Below, the ends, ways, and means employed by the successful strategies are summarized.

Ends

Whenever spoilers are present, whether CPS or any other manifestation, the mission should include among its primary aims to minimize or eliminate the threat they pose to the peace or stabilization process. For CPS, however, the emphasis should be on curbing their spoiling behavior and not on seeking to stifle unrelated organized crime or corruption.

Ways

- Strategies should be tailored to the different types of CPS.

Our case studies confirm Stedman's assertion that there is "a range of strategies to deal with spoilers, from ones that rely heavily on conciliation to ones that depend greatly on the use of coercion..."⁵⁰ Strategies must be tailored, therefore, to the degree and type of recalcitrance manifested by the CPS.

Irreconcilables are not amenable to conciliation and must be dismantled or defeated. Coercion is also an essential component of a strategy for combatting violent CPS with negotiable interests. The purpose for the use of force, however, is different. It is to raise the costs of using violence

to unacceptable levels. Since it is difficult to discern whether interests are reconcilable or not (especially in the wake of a peace agreement), it is prudent to combine any use of force in the face of episodes of violence with renewed overtures for a diplomatic resolution.

Thus coercive diplomacy is appropriate for both types of CPS until irreconcilables make it manifest that negotiation is futile. To persuade CPS with negotiable interests that there are more attractive peaceful alternatives than exploitation of violence and criminally derived wealth to attain power also requires development of institutions that can sustain the rule of law; respect for human rights and minority rights; free and open elections; and an enabling environment for a free market economy.

At the other end of the spectrum, for CPS that support the peace process, coercive force is inappropriate. Nevertheless, dissuasive consequences must be created for seeking to capture and exploit the state for personal or political gain. This requires development of institutions capable of providing transparency and accountability, including the rule of law and honest elections.

- Conflict transformation is an appropriate way to combat all types of CPS.

The strategies used in most successful cases (Bosnia, Sierra Leone, Kosovo, Iraq--JAM, and Colombia) aligned with the three mutually reinforcing lines of effort involved in conflict transformation.⁵¹ *While all three lines of effort complement each other and should be used in tandem, the emphasis given to each should be tailored to the type of CPS engaged in spoiling behavior.* The variation in emphasis that should be given to the three lines of effort involved in conflict transformation is specified below:

- Shape the environment by addressing the drivers of conflict.

This line of action will be most essential and decisive with irreconcilables (e.g., Bosnia, Sierra

⁴⁹ For a full elaboration of these findings, see Michael Dziedzic, "Conclusions," in Dziedzic, *Criminalized Power Structures*.

⁵⁰ Stedman, "Spoiler Problems in Peace Processes," 7.

⁵¹ See Jock Covey, et al., *Quest for Viable Peace*.

Leone, and Haiti). Dissuasive consequences must be established for use of violence. To deal with irreconcilables as well as violent opponents, the mission must have the military proficiency to protect civilians, the mission, and the mandate; however, the most sustainable way to accomplish this is through intelligence-led operations, which result in evidence that can be used in legal proceedings that are autonomous from the influence of CPS.

Exploitation of illicit revenue to capture power is also a driver of conflict. Since all CPS are characterized by this, all missions confronted by a CPS spoiler threat should have the ability to track illicit revenue streams, both internal and international, and shut them down.

- Institutionalize more attractive peaceful alternatives for pursuit of wealth and power.

This component of the strategy is at the heart of transforming violent opponents into peaceful supporters of the peace process. Legitimate institutions to mediate the competition for wealth and power need to be nurtured by the international community in order to sustain the peace process after the CPS threat has been diminished.

The most challenging aspect is ending impunity when CPS have insinuated themselves into the apparatus of government. To do this, a more sophisticated approach than merely building domestic capacity and then turning ownership over is required. To stabilize these situations, it is vital for the international community to play a more direct role in buttressing the prevailing legal system in order to render CPS vulnerable to criminal prosecution and incarceration before transitioning to indigenous ownership (e.g., Kosovo).

- Develop safeguards on the performance of institutional capacity that is being developed to prevent state capture and future abuse of power.

This is the most effective way to prevent supporters of the peace process from emerging as dangerous spoilers. Safeguards provide

transparency and accountability and serve as a barrier against capture of the state by criminalized elites. They must be developed in the structures of government and civil society to provide an effective check on abuse of power.

The State Department's Bureau of Conflict and Stabilization Operations has adopted conflict transformation as their paradigm for strategic planning, so this research provides empirical evidence that their strategy has the versatility to cope with the full spectrum of spoiler threats.

*Means*⁵²

- Assess whether CPS are a threat and, if so, determine the type involved⁵³

As Stedman observed, "(T)he choice of an appropriate strategy requires the correct diagnosis of the type of spoiler."⁵⁴ Just as vital is to avoid overlooking the CPS threat in the first place and exposing the mission to risk of failure and years of incompetence.

- Track the revenue streams sustaining CPS and shut them down⁵⁵

All types of CPS rely on illicit revenue to secure and maintain power. To undercut this threat, expertise is needed to monitor illicit money flows; investigate grand corruption and theft of international assistance; prosecute those responsible; and seize ill-gotten gains.

- When the domestic legal system has been suborned by CPS, the international community will need to play an active role in establishing rule of law.⁵⁶

The international community must take the initiative to confront these enemies of peace. Essential capabilities include collection of

⁵² See Michael Dziedzic, ed., *Combating Criminalized Power Structures: A Toolkit* (Lanham, MD: Rowman and Littlefield, 2016).

⁵³ Dziedzic, *Criminalized Power Structures*, 395-9.

⁵⁴ Stedman, "Spoiler Problems in Peace Processes," 7.

⁵⁵ Dziedzic, *Criminalized Power Structures*, 404-8.

⁵⁶ *Ibid.*, 400-04, 414-19.

criminal intelligence; high-risk arrest; and international judges and prosecutors to adjudicate crimes against the mandate through the use of hybrid justice institutions.

- Develop effective mechanisms for transparency and accountability.⁵⁷

For peace to be sustainable and to avoid politicization or criminalization of the capacities developed by the international community, *especially the security sector and intelligence apparatus*, equal priority should be given to development of transparency and accountability. The most essential institutions are a free press; an independent judiciary; a mobilized civil society; and an electoral process conducive to alternation in power.

One purpose of this article has been to present evidence that CPS are the predominant spoiler threat to peace implementation. The ten case studies detailed in *Criminalized Power Structures: The Overlooked Enemies of Peace*, three of which are summarized above, provide extensive documentation to substantiate this. Overlooking this spoiler threat has brought several of the missions examined by this project to the brink of collapse, and by arriving unprepared to deal with this recurrent threat, peace and stabilization missions have squandered the golden hour. In the ten cases we examined, the average delay in obtaining authorization for essential authorities and capabilities was almost five years.

Another key finding of this work is that criminalized power structures come in three discrete forms: irreconcilables, violent opponents with negotiable interests, and supporters of the peace process. Owing to the variation in types of CPS, strategies must be designed to confront their spoiling behavior in an appropriate manner. The strategies used in the most successful cases (Bosnia, Sierra Leone, Kosovo, Iraq – JAM, and Colombia) aligned with the three mutually reinforcing lines of effort involved in conflict transformation.

Perhaps the most troubling consequence of the propensity to overlook criminalized power structures is that they may not only spoil peace processes and stability operations; they may also spoil international willingness to support the very enterprise of peace implementation. The ultimate goal of this work is to improve upon the success rate of interventions by asking the right questions before intervening so the risks posed by criminalized power structures are recognized prior to deployment. This will allow international peace missions to be endowed with authorities and resources required to succeed and to be guided by strategies appropriate for the type of CPS involved.

⁵⁷ Ibid., 408-13.

TABLE 1: Assessment of Success by Type of Criminalized Power Structure (CPS)

Irreconcilable CPS

<u>Case</u>	<u>CPS</u>	<u>Outcome</u>
Bosnia	Third Entity Movement	Success (after risking failure)
Sierra Leone	RUF	Success (after risking failure)
Haiti	Gangs of Cité Soleil	Partial success (after risking failure)
Guatemala	CIACS	Partial success (after risks were exacerbated)

Violent Opponents with Negotiable Interests

<u>Case</u>	<u>CPS</u>	<u>Outcome</u>
Kosovo	Kosovo Liberation Army	Success, with qualifications
Iraq	Jaish al-Mahdi	Success, with qualifications
DRC	M-23	Partial success

Supporters of the Peace Process

<u>Case</u>	<u>CPS</u>	<u>Outcome</u>
Colombia	Paramilitaries	Success
Afghanistan	Criminal Patronage Networks	Failure
Iraq	Nouri al-Maliki	Failure

Cadet Voice

Hypersonic Weapons' Effect on Strategic Stability

Darren Sency

Initial exploration of the relationship between new technologies and strategic stability finds that hypersonic weapons, regardless of which power deploys them, first, could raise the probability of nuclear war.

The United States Air Force's high speed/hypersonic integration and demonstration line of budgeting nearly tripled for fiscal year 2017. The \$92.8 million displays intensifying interest in the realm of hypersonic research.¹ Without providing details, the level of classified work being done in developing this technology has been said to be "far more extensive."² The era of hypersonic weapons is underway. With the introduction of new military technology, the effects on the methods by which future wars are fought and the political arena which will frame these conflicts should be considered. The strategist Colin Gray offers, "All military behavior is tactical in execution, but must have operational and strategic effect, intended and otherwise."³ The purpose of this paper is to suggest that the capabilities presented by hypersonic weapons are inherently destabilizing at the strategic level.

During testimony to the United States Congress in December 2015, leading policy expert James M. Acton of the Carnegie Endowment for International Peace opened by stating, "Let me emphasize from the start that I am genuinely undecided about whether the United States should acquire CPGS (Conventional Prompt Global Strike) weapons. The capability would unquestionably convey potential benefits, but it would also carry potential risks. Today, in my opinion, the relative magnitudes of those benefits and risks are unclear."⁴ It is important to note at the onset that this study aimed neither to find an answer to that question nor form any opinion on

the issue. The aim has been and remains to objectively weigh capabilities presented by this technology and assess the strategic implications.

A level of difficulty exists in assessing weapons capability of a developing technology. Open source information leaves something to be desired in that it can be outdated or fails to reflect what a fielded weapons system may eventually look like. The desire to determine the effects of specific capabilities while remaining broad about what said capabilities look like on paper proved challenging.

For this reason, it is important to outline the parameters of this discussion. The definition of strategic stability that will be referenced will be from scholar Elbridge Colby.⁵ He counts as stable any scenario providing "no incentives for *nuclear* use save for vindication of vital interests." While there are a variety of systems being researched, hypersonic weapons will be broadly defined as any weapon travelling in excess of Mach 5—to exclude intercontinental ballistic missiles. Finally, the effects of these weapons systems on strategic stability will be viewed in a generic sense on the state level from no parochial perspective—statements from different state perspectives will be utilized to frame the strategic environment and hypersonic weapons' potential effects.

STRATEGIC STABILITY

The 2010 U.S. Nuclear Posture Review uses the words "stable," "stability," and

¹ Giangreco 2016.

² Gertz 2016.

³ Gray 2015, p. 48.

⁴ Acton 2015.

⁵ Colby was recently Robert Gates Senior Fellow at the Center for a New American Security, Washington, D.C. and is now U.S. Deputy Assistant Secretary of Defense for Strategy & Force Development (ed.).

“instability” forty-nine times in the main text, but governments around the world aspire to achieve “strategic stability”—an end which is as easily defined as it is attained.⁶ Certain forces, certain force employment postures, and certain kinds of negotiated agreements could be the means by which this goal is attained. The abovementioned definition that we will focus on, again, is “no incentives for nuclear use save for vindication of vital interests.”⁷ This definition reflects the intellectual marriage between strategic thought and nuclear weapons—the domain which hypersonic weapons will affect, intentionally or not.

Gregory Koblentz’s *Strategic Stability in the Second Nuclear Age* outlines myriad reasons why the strategic environment is less certain now than it was during the Cold War. The same psychological imperatives that existed during the Cold War prevail in a less certain, more complex strategic environment involving new dynamics and technologies.

Fifty-five years ago, Thomas Schelling and Morton Halperin defined strategic nuclear stability in a bilateral standoff between the Soviet Union and the United States as requiring reduction in incentives for preemptive strike. They added that strategic stability should be “reasonably secure against shocks, alarms and perturbations.”⁸ Since the fall of the USSR, it had seemed unlikely that great power conflict would erupt along the lines premised by Schelling/Halperin. “As the memories of the terrors of the world wars and the nuclear fears of the Cold War fade,” the legacy of the strategic nuclear environment persists, certainly in the US-Russian relationship but also in the relations of all nuclear powers.⁹

As Koblentz notes, today’s strategic environment is characterized by an “explosive mixture of unresolved territorial disputes, cross-border terrorism, and growing nuclear arsenals.”¹⁰ He

argues that compared to the Cold War bilateral dynamic, the world is complicated by, his term, “security trilemmas”—a traditional security dilemma in which there are unintentional tertiary effects.

Contrary to what is true in the physical world, where three points provide more stability than two, in the international arena, triangles may make a situation more unstable and difficult to control (escalation dominance) as they introduce more variables into the algebra of deterrence.¹¹

While the immediate threat of major power, nuclear war is not of immediate concern, the playing field is more crowded and less certain, and strategic theory has not kept pace. The strategic environment demands attention to various capabilities, which all provide “different levels of utility for deterrence, war-fighting, coercion, and assurance.”¹²

The ability to deter, to coerce, or to assure all depend upon one’s ability to effectively communicate. The lack of balance presented by the states with strategic—nuclear and otherwise—capabilities complicates the ability of any to effectively communicate. Over seventy years of cold war rivalry, a relationship gradually developed between the USSR and USA, but today’s environment provides no such relationships between strategic partners, save the enduring US-Russian legacy.

At the same time, there remains a common and necessary thread of vagueness surrounding the policies of nuclear states. The US, Britain, and France all have limiting but nonbinding descriptions as to when they would resort to nuclear force if at all. Russia, for example, “reserves the right to use nuclear weapons in response to the use of nuclear and other weapons of mass destruction against Russia and/or its allies...[and in conventional war] when the very existence of the State is under threat.”¹³

⁶ Colby 2013, p. 118; Acton 2015.

⁷ Colby 2013, p. 51.

⁸ Koblentz, 2014, p. 19.

⁹ Colby 2013, p. 71.

¹⁰ Koblentz 2014, p. 3.

¹¹ Delpech 2012, p. 39.

¹² Koblentz 2014, p. 31.

¹³ Koblentz 2014, p. 13.

In efforts to reduce the threat of nuclear use, the United States, and other powerful adversaries, are pursuing “non-nuclear precision-guided weapons...for striking critical, time-sensitive targets...[creating] new risks to strategic stability and [making] other states less willing to reduce their own reliance on nuclear weapons.”¹⁴ In regards to strategic weapons, it is the capability rather than the intent of a system that matters for national security policy makers.

In the modern strategic environment, even a bilateral relationship in pursuit of strategic stability is complicated:

The essential idea of strategic stability is that if both sides field forces that are capable of surviving a first strike and can credibly demonstrate to one another that their current and future capabilities cannot deny the other side a viable strategic deterrent, this confidence would eliminate the fear of preemption and the need to launch weapons early, either as irritants in a crisis or as dangers in conflict. This would reduce the danger that nuclear war might begin because of essentially technical “use or lose” or “itchy trigger-finger” fears—concerns that can become very real in crises and conflicts.¹⁵

Confusion, ambiguity, and pressure are the nemesis of strategic stability. Repercussions of these qualities are a function in part of fundamental aspects of deterrence thought that grew out of the Cold War. Certain modes of thought developed in those years still apply in the current environment. A brief discussion of these principles is thus essential in determining the potential destabilizing effects of hypersonic weapons.

DETERRENCE THEORY

Nuclear deterrence depends upon psychological elements of calculation for which there are no physical proofs, and it is therefore

¹⁴ Koblentz 2014, p. 24.

¹⁵ Colby 2016.

precarious by nature.¹⁶ Deterrence calculations are made in the context of the strategic environment and the perceived threat from adversaries. At the root of formulating offensive and defensive security measures, as Admiral Richard Mies notes, “Nations don’t distrust each other because they are armed; they are armed because they distrust each other.”¹⁷

In 2016, policy support for tactical and operational employment of *strategic systems* seems to mirror Spurgeon Keeny’s mapping from the 1980s: those attempting to deter a wider range of actions and “those who are simply trying to carry out their military responsibilities in a more “rational” or cost-effective manner.”¹⁸ The patterns learned in the Cold War still provide lessons for the modern day.

The first principle of importance to note is the fact that, “requirements of deterrence are not static. Rather, technology provides a dynamic variable which affects both the deterrer and the state to be deterred.”¹⁹ This reality is enduring. Policy makers still have to consider the strategic implications of new weaponry.

This dynamic was foretold in writings from the Cold War. “This situation is not peculiar to present force structures or technologies; and, regardless of future technical developments, it will persist as long as substantial nuclear weapon stockpiles remain.”²⁰ While this new wrinkle—hypersonic weapons—is not necessarily a nuclear weapon issue, the existence of nuclear stockpiles by countries pursuing these technologies necessitates the consideration of these theories.

Perhaps the most telling statement explaining this dynamic is as follows:

Over time, aided by technological advancements in targeting accuracy, new delivery means, and improved command and control mechanisms,

¹⁶ Shultz, et al. 2011.

¹⁷ Mies 2013, p. 43.

¹⁸ Keeny 1981.

¹⁹ Foerster 1982.

²⁰ Ibid.

competing notions of deterrence have evolved which are more traditional in their roots... *deterrence by denial*... emphasizes the traditional objective of military defense threatening to deny the attacker success in the achievement of military and political objectives, thereby deterring an attempt that would be not only costly but, more to the point, unsuccessful.²¹

A stable dynamic, then, would be one in which neither side saw an incentive to strike first. The advent of an offensive weapon system that could disarm the adversary preemptively is incredibly destabilizing. “If *either* side feels that it could be deprived of a retaliatory capability, then there is a powerful incentive for *both* sides to strike first.”²²

The duality of the offensive/defensive nature of nuclear weapons is made more complex in that any use would be “physically indistinguishable from weapons which are designed for a disarming first strike.”²³ The new capabilities and resulting considerations coming from the development of hypersonic weapons requires a deeper understanding of the technology itself.

HYPERSONICS

The deterrent value of hypersonic weapons is summarized by former Assistant Secretary of Defense for International Security Policy Peter C.W. Flory in the following manner:

In this new and uncertain environment, a “one size fits all” approach to deterrence is no longer appropriate; we must re-think our approach to 21st Century threats and tailor deterrence to assure our allies and friends, and achieve specific effects against a wide array of potential adversaries and circumstances, such as advanced military competitors, regional WMD states, and non-state terrorist networks. To do this we must have a

broad range of credible strategic capabilities—including nuclear and non-nuclear Global Strike capabilities, defenses, and a revitalized . . . infrastructure.²⁴

There is a value at the strategic level provided by hypersonic weapons. They could provide policy makers with an added dimension of options in a crisis or conflict. From a US perspective there exist “important political and strategic advantages . . . in being able to strike high-value targets having time-sensitive urgency that could not be effectively engaged by currently available conventional strike systems.”²⁵

As mentioned before, a great deal of strategic and deterrence thinking comes from the domain of nuclear weapons and policy. For example, a 2014 RAND report on hypersonic technology suggested that hypersonics could be fitted to become a new type of unstoppable nuclear weapon.²⁶ Interesting, though, Assistant Secretary of Defense for Research and Engineering Stephen Welby said, “There’s nothing in the budget” related to modeling, researching, or exploring nuclear-armed hypersonics by the United States.²⁷

The United States Air Force does have a long-term plan for the development of hypersonic technology. The timeframe suggests that a “tactical strike missile” would be the first operational military asset, ready around year 2020. Future plans include an intelligence, surveillance, and reconnaissance (ISR) platform around 2030, and the USAF aspires to produce a “reusable and persistent ISR and strike craft by 2040.”²⁸

These systems represent the emerging hypersonic cruise missile variety of weapon. However, two primary categories emerge within the literature: hypersonic cruise missiles and hypersonic maneuvering reentry vehicles. The latter category

²¹ Ibid.

²² Ibid.

²³ Ibid.

²⁴ Bunn 2011, p. 3.

²⁵ Bunn 2011, p. 6.

²⁶ Tucker 2016.

²⁷ Ibid.

²⁸ Ibid.

—commonly referred to as boost glide reentry—is the primary focus of concern for this study.

The development process for this technology will likely mirror that for all nations pursuing these capabilities. The technology’s effect on strategic stability will likely center on its strike role—i.e., a boost glide weapon launched via ballistic missile. Existing infrastructure for launching a boost-glide weapon would suggest this would also be the first capability to become operational. Potential effects on strategic stability are therefore most easily framed via boost glide reentry vehicles, although some effects may be true for the cruise missile variety as well.

In assessing possible upsides for the weapon system, a January 2016 Mitchell Institute for Aerospace Studies report offered the following:

Hypersonic weapons offer advantage in four broad areas for US combat forces. They can project striking power at range without falling victim to increasingly sophisticated defenses; they compress the shooter-to-target window, and open new engagement opportunities; they rise to the challenge of addressing numerous types of strikes; and they enhance future joint and combined operations. Within each of these themes are other advantages which, taken together, redefine military power projection in the face of an increasingly unstable and dangerous world.²⁹

CAPABILITIES AND CONSEQUENCES

Operational and tactical competencies provided and enhanced by hypersonic strike systems alone—future developments notwithstanding—are indeed impressive, exciting, and arguably necessary in a modern war scenario. Nevertheless, utilizing these weapons carries risks for those considering the strategic nuclear aspects of warfare.

The speed at which hypersonic weapons travel could have negative *strategic* effects in terms of stability. The *operational* and *tactical* asset of

²⁹ Hallion 2016, p. 2.

“[shrinking] the ‘time to target’ window” creates a problem in the strategic nuclear domain.

“Fourth dimension” effects of “[getting] inside an adversary’s command, control, and battle management cycle” are also a tremendous asset at the operational and tactical level.³⁰

The speed of a hypersonic weapon greatly compresses the so-called “find, fix, track, target, engage, and assess” (F2T2EA) process, enabling US commanders the ability to penetrate an opponent’s decision making process, and as a result, rapidly put an adversary on the defensive.³¹

However, regarding escalation control and incentives to strike first, the same capability becomes dangerous. By forcing an adversary’s decision making process, a rushed choice could lead to mistakes or misinterpretations. This is not desirable at the strategic level. An adversary fearing the destruction of its strategic weapons could feel the need to employ those weapons preemptively. “‘Strategic’ does not just mean nuclear.”³²

Hypersonic weapons provide unprecedented promptness and global reach. “A theater-ranging hypersonic missile will reach a target 1,000 miles distant within 17 minutes or less.”³³ The range of these weapons compounded with accuracy creates further pressure on decision makers in a crisis to feel as though their interests are held at immediate risk.

Hypersonic weapons could effectively prosecute command, control, and communications (C3) points, key leadership, and key ground, naval, and maritime targets. Hypersonic strike weapons could more effectively engage high value targets... The speed and reach of hypersonic strike could preempt the launch of a theater ballistic missile. Hypersonic weaponry could also address

³⁰ Ibid., p. 13.

³¹ Ibid., p. 8.

³² Bunn 2011.

³³ Hallion 2016, p. 13.

the challenge of hardened and buried targets.³⁴

In the context of a nuclear crisis or the mindset of a strategic adversary, these aforementioned capabilities are themselves a forcing function for fearful, mistake-prone, and escalatory reactions. The mere perception of a capability regardless of intent is potentially destabilizing at the strategic level.

The payload along with the kinetic ability of the weapon system is also concerning at the strategic level. A hypersonic weapon could be nuclear armed or provide combat effects like an anti-ship ballistic missile (ASBM).³⁵ The capability to strike at hypersonic speed creates devastating effects: when dropped on one's foot, a bowling ball inflicts a great deal of pain; the effect of a conventional payload, though, is amplified greatly once the "bowling ball" is shot from a cannon.

Concerns about nuclear ambiguity have been at the forefront of hypersonic debate in the United States since "2006, when President George W. Bush's administration first announced plans to replace the nuclear warheads on some Trident II D5 ballistic missiles with conventional weapons."³⁶ Inability to distinguish launch of a conventional versus nuclear missile resulted in Congress halting the program. Hypersonic weapons might also be indistinguishable between nuclear and non-nuclear variants—especially when launched from great distances. The strategic effects of conventional hypersonic weapons in any case complicate the analysis, which favors the argument that instability after deployment by any state party would increase.

One solution to the warhead ambiguity issue was the suggestion that a state could observe the flight path of a weapon and determine that non-ballistic reentries were non-nuclear. This is complicated for a number of reasons, the first of which being that there may be no reason to assume non-ballistic, boost-glide trajectories carry only conventional weapons. Further, given the current

technology, "[the state] would see the launch of a weapon that would quickly disappear from view, and the remainder of the flight path would be untraceable given current technology."³⁷ Another mitigating factor offered by the Air Force would be segregation. Ballistic missiles containing conventional, boost glide reentry vehicles would be positioned far and apart from the nuclear arsenal. "Two potential bases included Vandenberg Air Force Base on the West Coast and Cape Canaveral on the East Coast."³⁸

Maneuverability of reentry vehicles is a double-edged sword. Boost-glide reentry vehicles could allow a hypersonic weapon "to avoid flight over third party nations when approaching the target."³⁹ This same quality would permit the weapon after launch to "radically change its trajectory to avoid missile defenses."⁴⁰ These tactical advantages are sometimes referred to as destination ambiguity, which, unfortunately, at the strategic level "could potentially lead a different adversary to conclude that they were under attack, risking inadvertent escalation. (The risk would be even greater if the observing state also misidentified [a conventional] weapon as nuclear armed.)"⁴¹

Lockheed Martin's Skunk Works® conception of a hypersonic weapon advertises "responsive strike capability on time-critical, heavily defended targets and...high survivability through altitude, speed and stealth."⁴² Such capability at the tactical level would overwhelm or evade enemy air defense systems. Yet, these same systems *of the adversary* provide mutual strategic benefit in terms of psychological reassurance. A single target, removed by a hypersonic weapon in a successful tactical strike could have drastically different, destabilizing consequences at the strategic level.

³⁴ Ibid., p. 17.

³⁵ Fisher 2015.

³⁶ Bunn 2011, p. 17.

³⁷ Ibid., p. 17. This is accurate as of 2011; the capability may or may not have advanced since then.

³⁸ Woolf 2015, p. 14.

³⁹ Kable Intelligence Ltd. 2016.

⁴⁰ Fisher 2015.

⁴¹ Bunn 2011, p. 17.

⁴² Lockheed Martin 2016.

CONCLUSION

Viewed through the lens of a tactical/operational versus a strategic mindset, the same set of capabilities can be either encouraging or terrifying.

Instead of working to establish air superiority, establish tanker support, position personnel recovery assets, establish airborne command and control networks, prosecute electronic warfare, and infiltrate attack platforms through myriad defenses, a hypersonic strike would unfold far more rapidly, with far fewer support requirements. Unable to intercept these high speed weapons, a first strike wave could simultaneously eliminate the most heavily defended enemy nuclear facilities and key targets in a fraction of the time, at a much lower threshold of risk to attackers.⁴³

The development of hypersonic weapons technology is likely to be perceived as an effort to deny other states their retaliatory nuclear capability—and achieve a splendid first strike, one of Schelling and Halperin’s conditions for strategic instability.⁴⁴ In fact, nearly every provocative narrative warned of by Schelling and Halperin at the start of the Cold War is revisited in the modern security environment by today’s nonnuclear strategic weapons, which lie outside the nuclear “taboo” established gradually after 1945.

While the strategic arena is complex, with new players and new capabilities, it is important to recognize that strategic stability and deterrence principles have the same roots as during the Cold War and before that in the history of warfare. “To modify and adapt Clausewitz, nuclear weapons changed the grammar of deterrence, not its character.”⁴⁵

Hypersonic weapons—conventional or nuclear, ours or theirs—further complicate the equation. Efforts to ease strategic miscalculation must also be stressed in coming years as the global security environment continues to shift.

As Dr. Acton advocates, all parties pursuing hypersonic weapons should take steps to assess the full range of escalation risks.⁴⁶ And as industry experts state, “Hypersonics technologies and weapons are both vitally important and inevitable.”⁴⁷ This being the case, statesmen, military professionals, and industry leaders should consider the strategic implications of serving tactical and operational targets with hypersonic weapons.

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⁴³ Hallion 2016, p. 4.

⁴⁴ Koblentz 2014, p. 26.

⁴⁵ Colby 2013, p. 87.

⁴⁶ Acton 2015.

⁴⁷ Hallion 2016, p. 25.

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Book Review

***The Physics of Wall Street: A Brief History of Predicting the Unpredictable* by James Owen Weatherall**

Brian M. Kruchkow

A USAFA graduate comments on predicting the unpredictable when surveying new spaces at the frontiers of defense policy.

James Owen Weatherall's book about the robust interplay of Wall Street and physics is a captivating romp about select physicists as well as a lesson on how finance both succeeds and falls short when it applies mathematical models to predict economic behavior.¹ Such a book is a surprising candidate for a review in *Space and Defense*. Yet the ideas Weatherall presents are innovative, and they offer a framework for thinking about the problems with which this journal is concerned. In fact, *The Physics of Wall Street* provides a timely solution to a major challenge space and defense policy faces in modeling rare political events.

The Physics of Wall Street is an easy read, for Weatherall has made his book interesting as both intellectual history and personal narrative. Finance and physics are not top reads for most people, of course, unless they are a practitioner in either field or they need highly specialized information. Yet Weatherall's book appeals to a wide audience with insightful biographies of physicists who shaped finance. Each chapter of the book begins as a story about a notable physicist, and introduces the mathematical theory for which that person is known. Weatherall, as an example, uses anecdotes from the brief life of Louis Bachelier, intertwined with Bachelier's revolutionary idea of how price changes are in essence a random walk.² This is the central virtue

of the book; neither physics nor finance ever becomes dull. Indeed, the mathematical theories of the physicists become irresistible as the currency for appreciating their rich life story.

Weatherall adeptly explains complicated mathematics and financial theories, making these ideas accessible for anyone curious enough to open the book. One of the most delightful parts of *The Physics of Wall Street* is when Weatherall cheerfully walks the reader through the discovery of log-normal distributions (skewed bell curves) and how this realization affected expectations of volatility and ultimately prices in the stock market.³ Greater still is Weatherall's explanation of Cauchy-distributions: how a mathematician named Benoit Mandelbrot proved that the standard deviation of prices most people thought of as normal actually needed to incorporate "extreme" events more frequently than expected, which Mandelbrot termed as "fattening the tails."⁴ The book eases the reader through these concepts and makes sure to enliven math and financial terms with stories about how Mandelbrot and others came to their ideas. In this way Weatherall transforms two difficult subjects into a pleasant and edifying journey for any reader.

One area where the book falls short is Weatherall's sanguine treatment of the people about which he writes. Weatherall, of course, must discuss the merits which make each of his characters worthy of being in the book; however,

¹ 2Lt. Brian Kruchkow, USAFA '16, is a pilot in the U.S. Air Force. Weatherall, James Owen. *The Physics of Wall Street: A Brief History of Predicting the Unpredictable* (New York: Mariner Books, 2013).

² Weatherall 2013, pp. 1-24.

³ Ibid., pp. 35-39.

⁴ Ibid., pp. 49-75.

there also has to be context. The entirety of Chapter 5, for example, is about Fisher Black, one of the thinkers who created and profited from the model we use today to price derivatives. Yet Weatherall elides the controversy still raging in economic circles over whether Black was indirectly responsible for one of the largest financial collapses in history, which nearly brought down the entire derivatives market.¹

Weatherall's formula of giving biographical information of the physicists he chooses makes for an interesting read, but most of that information covers only favorable fragments of the character's career; it does not present a holistic view of the physicists' work or negative social implications of their respective ideas.

SPACE & DEFENSE DEVOTEES AND THE PHYSICS OF WALL STREET

The salient reason why this book matters for *Space and Defense* is that some of the ideas shaping contemporary physics and finance are pertinent to contemporary defense thinking. When Weatherall covers Mandelbrot, the reader quickly realizes the monumental shift Mandelbrot the individual brought to our collective understanding of the world in which we live.

Essentially Mandelbrot proved our world is much more volatile and less stable than we choose to believe, even after we see data definitively indicating its volatility. Tremendous price movements, for example, happen much more frequently than expected, just as extreme events in general happen more frequently (in the fat tails of a non-normal distribution). This finding is sobering to those equipped with a mere bell curve, attempting to defend not only financial order but a peaceful and just world order. *The Physics of Wall Street*, then, is an introduction to thinking anew about innovation, risk, and predicting what may happen in Nature, whether physical, economic, or social.

Toward the end of his biographies, Weatherall introduces the reader to a little-celebrated physicist named Didier Sornette and showcases

Sornette's groundbreaking theories on log-periodic predictions.² Weatherall deftly explains how Sornette's model predicted the 2008 financial crisis as a culmination of precursors, relatively tiny cracks in the system.

With this account, Weatherall offers policy makers a realistic hope that humanity can predict catastrophic events, which any policy maker concerned with national defense in an international system of states must consider. Perhaps some extreme events so frequent in Mandelbrot's model may be accurately predicted in a timely manner by Sornette's approach. If so, this would raise the bar on what policy makers may do in mitigating or preventing catastrophic events from happening in the first place.

Weatherall's book stands on the thesis that significant real world events are more predictable than they appear. This opposes conventional wisdom for many concerned with space and defense. Our standard notions hew closer to the black swan theory popularized in Pentagon circles by Nassim Taleb.³ Taleb warns that black swan events will at some point upend the world, and there is *no way* to head them off.

While it seems unlikely that all catastrophic events will ever be predicted accurately, Weatherall, *contra* Taleb, urges it is worthwhile to attempt to model these outcomes and to test models by investing precious resources Taleb would hold in reserve. In this sense, Weatherall's book gives a refreshing rebuttal against darkness and paralysis induced by black swans. Defiant to the end, Weatherall parades real-life example after example of problem-solvers who did not tarry but strove mightily until eventually they predicted the unpredictable.

¹ *Ibid.*, pp. 105-129.

² *Ibid.*, p. 169.

³ Nassim Taleb, *The Black Swan: The Impact of the Highly Improbable* (New York: Random House, 2010).

Notes for Contributors to *Space & Defense*

Space & Defense seeks submissions that will contribute to the intellectual foundation for the integration of space into overall security studies.

Indeed, the emergence of space as a unique and critical element in national security, economic security, homeland security, cyber security, environmental security, and even human security has persuaded us that this line of inquiry is vital to innovation for international security.

Contributions are welcome from academic scholars and policy analysts at think tanks and research institutes; senior management and policy officials from international and governmental agencies and departments relevant to space and security issues; senior management and policy officials from organizations responsible for critical national and international infrastructures that rely upon space; major aerospace corporations; scientists and engineers interested or involved in space and security policy issues; military officers and operators in relevant units, commands, and in staff colleges and service academies.

The journal welcomes submissions of scholarly, independent research articles and viewpoint essays. There is no standard length for articles, but 7,500 to 10,000 words, including notes and references, is a useful target for research articles, and viewpoint essays should be in the range of 2,500 to 5,000 words. The opinions, conclusions, and recommendations expressed or implied within *Space & Defense* are those of the contributors and do not reflect those of the Eisenhower Center for Space and Defense Studies, the Air Force Academy, the Air Force, the Department of Defense, or any other agency of the United States Government.

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Details of the author's institutional affiliation, full address, and other contact information should be included in a separate file or cover sheet.

Contributors are required to submit all articles electronically by email attachment as a Microsoft word file (.doc or .docx format).

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TABLES AND FIGURES

All maps, diagrams, charts, and graphs should be referred to as figures and consecutively numbered and given appropriate captions. Captions for each figure should be submitted on the same page as the figure to avoid confusion. Tables should be kept to a minimum and contain only essential data. Each figure and table must be given an Arabic numeral, followed by a heading, and be referred to in the text. Figures and tables are not to be embedded in the text. Each table and figure should be clearly labeled. In the text, make sure and clearly explain all aspects of any figures or tables used.

STYLE

Authors are responsible for ensuring that their manuscripts conform to the style of *Space & Defense*. The editors will not undertake retyping of manuscripts before publication. Please follow the Chicago Manual of Style.

Listed below are some additional style and writing guides:

- Dates in the form: 1 January 2009.
- Headings (bold, ALL CAPS, title case and centered).
- Subheadings (bold, italic, title case and centered).
- Acronyms/abbreviations should always be spelled out in full on first use in the text.
- The 24-hour clock is used for time, e.g., 0800, 1300, 1800.
- Use percent rather than % except in figures and tables.
- For numbers, spell out numbers less than 10.
- Make use of 21st style where appropriate.
- Keep capitalization to a minimum.
- Concise paragraphs and sentences are desirable.
- Avoid a paper that is just descriptive; rather engage the literature and provide analytical rigor and assessment.
- Avoid policy recommendations in the analysis part of paper; leave this, if applicable, for a separate section at the end of the paper.
- Define all new terms used in paper.
- Avoid hyphenated words when possible (e.g., low Earth orbit).
- Avoid the use of passive voice when possible.
- Footnotes, numbered consecutively with a raised numeral in the text, use the Insert-Preference-Footer function of Word.