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Investment Protection of Commercial Activities in Space: Treaties, Contracts, Licenses, Insurance, Arbitration

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Abstract

The article focuses on the protection of foreign investment against political risk in the host state regarding commercial activities in outer space, an area not subject to national appropriation and sovereignty. The general space treaty and national legal frameworks for such activities fail to address the needs of private space enterprises. Under international investment law, commercial space activities generally meet common subject matter scope definitions of 'investment' and 'investor' in investment treaties. But foreign acquisitions in the space industry may affect national security interests of the host state and be limited as a sector for foreign investment. Moreover, as investment treaties generally cover an investment only if it is made in the territory of the host state, uncertainties may arise as to whether activities and assets of space enterprises in outer space are covered.

Keywords

commercial space activities – foreign investment – investment protection – national security – outer space – political risk – territorial scope of investment treaties

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1 Introduction

Commercialization has become a major characteristic of the globalizing space economy. Borrowing from the 2010 White House National Space Policy document of the United States, the term 'commercial space activities' can be defined as

> space goods, services, or activities provided by private sector enterprises that bear a reasonable portion of the investment risk and responsibility for the activity, operate in accordance with typical market-based incentives for controlling cost and optimizing return on investment, and have the legal capacity to offer these goods or services to existing or potential ... customers.[1]

Commercialization is the key factor promoting the transition of the global space industry from 'OldSpace' to 'NewSpace'.[2] 'OldSpace' refers to the traditional space activities of governments and their prime or major contractors. 'NewSpace', on the other hand, is the domain of newer and smaller space companies that are pursuing innovative business models in new sectors.

Commercial services originally concentrated on satellite communications, especially to provide telephone and television coverage. They then turned to weather and geological assessment, commercial launching, remote sensing and global positioning. Most recently, commercial interest has been growing in the use of nano-satellites,[3] space-based data services, aerospace transportation, space-based manufacturing, space tourism, space mining, and even space colonies.[4]

Commercialization has become dominant in the value of the global space economy. While in 2015 the global space economy totaled about USD

1 National Space Policy of the United States of America (Presidential Directive, 28 June 2010) 10 <https://obamawhitehouse.archives.gov/sites/default/files/national_space_policy_6-28-10.pdf> accessed 24 September 2017.

2 'Old vs New: The Next Generation of the Space Industry' (*The Conversation*, 26 September 2016) <http://theconversation.com/old-vs-new-the-next-generation-of-the-space-industry-64793> accessed 24 September 2017. See also Baumann and others, 'NewSpace: A Wave of Private Investment in Commercial Space Activities and Potential Issues Under International Investment Law' (2018) 19 JWIT 930 (in this Special Issue).

3 See Irmgard Marboe (ed), *Small Satellites: Regulatory Challenges and Chances* (Brill 2016).

4 Paul Stephen Dempsey, 'National Laws Governing Commercial Space Activities: Legislation, Regulation, & Enforcement' (2016) 36 Northwest J Intl L & Bus 3.

323 billion,[5] slightly more than three-quarters (76%) of this amount (USD 246 billion) was attributed to commercial space activities. This includes commercial space products and services (e.g. telecommunications, broadcasting, remote sensing) in the amount of USD 126.33 billion, as well as commercial infrastructure and support industries totaling USD 128.88 billion. The latter includes space craft manufacturing, in-space platforms, and ground equipment, as well as launch services, independent research and development, and insurance.

Commercialization of space activities naturally brings commercial risk along with it. Commercial risk refers to the probability that expected benefits (profits or return) fail to materialize and invested capital may be lost. Any investment obviously has risks. But it is generally thought that commercial outer space ventures carry a tremendous amount of unpredictable risk.[6] Possible failure of space systems may lead to catastrophic consequences and total loss. It may mean the end of the business. Many investors are therefore not prepared to accept this kind and magnitude of risk, even if there is an offer of higher return rates to balance the risk. However, some argue that the space industry has learned to cope with this special kind of risk by adopting preventive and back-up measures, including system design, cautious modes of operation, using double or even triple sets of spares for key components and of course by seeking insurance cover.[7]

In fact, the percentage of catastrophic failures has remained relatively small. Space insurance premiums may be lower than one might expect and have been estimated in 2010 to be about 1–2% of the assets value.[8] Still, safety remains a critical issue, as not only the 1986 Space Shuttle disaster continues to remind us. In 2014, there were major explosions destroying the unmanned

5 The Space Foundation, *The Space Report 2016: The Authoritative Guide to Global Space Activity* (Space Foundation 2016) 1. See further The Tauri Group, *Start-Up Space: Rising Investment in Commercial Space Ventures* (Tauri Group 2016); Pierre Barbaroux, 'The Metamorphosis of the World Space Economy: Investigating Global Trends and National Differences among Major Space Nations' Market Structure' (2016) 20(2) Journal of Innovation Economics & Management 9–35.

6 For a discussion of diverse types of risks inherent in investing in the commercial space industry see Near Earth LLC, *Supporting Commercial Space Development Part 1: Support Alternatives Versus Investor Risk Perceptions & Tolerances* (Near Earth 2010) 33–61. See further Michael Laisné, 'Space Entrepreneurs: Business Strategy, Risk, Law, and Policy in the Final Frontier' (2013) 46(4) John Marshall L Rev 1039–54.

7 Near Earth (n 6) 60.

8 ibid 61.

launch rocket Antares[9] and the manned Virgin Galactic Space Craft Two in the United States.[10]

In the case of international investments, however, there is an additional general category of so-called 'political risks,' which are distinguished from normal commercial risks associated with business activities. Commercial risks may include, for example, fluctuating currencies or commodity prices, the unexpected emergence of a competitor with better products or services, or the bankruptcy of an essential supplier in a global supply chain. Political risks arise from negative interferences with the investment by the government or from political developments in the host state affecting the foreign investment.

The Multilateral Investment Guarantee Agency (MIGA), which operates under the auspices of the World Bank, has defined political risk as follows:

> Broadly defined, political risk is the probability of disruption of the operations of MNEs by political forces or events, whether they occur in host countries, home country, or result from changes in the international environment. In host countries, political risk is largely determined by uncertainty over the actions of governments and political institutions, but also of minority groups, such as separatist movements. In home countries, political risk may stem from political actions directly aimed at investment destinations, such as sanctions, or from policies that restrict outward investment.[11]

The Report further notes that the insurance industry itself employs a narrower definition of political risk limiting it to events in the host country only:

> According to this definition, political risk is divided into (i) currency convertibility and transfer, (ii) expropriation, (iii) political violence, (iv) breach of contract by a host government, and (v) the non-honoring of sovereign financial obligations ... Although there is a general consensus

9 Kenneth Cheng, 'Antares Rocket Explosion Leaves Questions and Dead Mosquito Eggs' (*New York Times*, 29 October 2014) <www.nytimes.com/2014/10/30/science/space/explosion-leaves-questions-and-dead-mosquito-eggs-.html> accessed 28 May 2018.

10 Joel Achenbach and Drew Harwell, 'Deadly Explosion of Virgin Galactic Spaceship Rattles Budding Industry' (*Washington Post*, 1 November 2014) <www.washingtonpost.com/national/health-science/deadly-explosion-of-virgin-galactic-spaceship-rattles-budding-industry/2014/10/31/57af5ea8-6141-11e4-9f3a-7e28799e0549_story.html?noredirect=on&utm_term=.36cd915e453e> accessed 28 May 2018.

11 MIGA, *World Investment and Political Risk* (World Bank 2009) 28.

over these categories within the PRI industry, exact definitions vary among insurers.[12]

In essence, political risk is addressed by the substantive standards of treatment to protect foreign investment and investors laid down in the broad network of bilateral investment treaties (BITs) and other international investment agreements (IIAs) that many states have concluded in the past decades. These standards focus on obligations of the host state and include non-discriminatory treatment, national treatment, fair and equitable treatment, full security and protection, the right to transfer funds, compensation for expropriation of property and most-favoured-nation treatment.

It should be noted at the outset, however, that there is no general agreement on a definition of 'investment'. This is also true for the space industry and space-related activities. Economists have a different approach than lawyers. Legal interpretations must carefully consider the specific legal instrument governing the relevant situation, for example, the definition of investment in the applicable BIT.

Typically, foreign investment takes place in the form of mergers, acquisition and takeovers of companies established abroad. This is called 'brownfield' investment.[13] It is distinguished from 'greenfield investment' where a new company is created (which supplies new jobs). Another distinction is the one between 'foreign direct investment' (FDI) and 'indirect investment', also called 'portfolio investment'. While portfolio investment seeks a return on investment without influence on the management decisions of the company, FDI seeks some control over the management. Usually, control of 10% of the voting stock is considered to be the threshold. Investment protection treaties often cover both FDI and portfolio investment.[14]

As the space industry is increasingly becoming globalized,[15] there are also more and more cases of foreign investment involved. The activities of the

12 ibid.

13 See Michael Kyle, 'Green-Field and Brown-Field Investments Unveiled' (*Investopedia*, 1 November 2017) <www.investopedia.com/ask/answers/043015/what-difference-between-green-field-and-brown-field-investment.asp> accessed 24 September 2017.

14 For definitions of FDI and portfolio investment see Marcin Humanicki, Robert Kelm and Krzysztof Olszewski, 'Foreign Direct Investment and Foreign Portfolio Investment in the Contemporary Globalized World: Should They Be Still Treated Separately?' *Narodowy Bank Polski (NBP) Working Paper No 167* (2013) <www.nbp.pl/publikacje/materialy_i_studia/167_en.pdf> accessed 26 May 2018.

15 See Bhavya Lal and others, *Global Trends in Space, Vol 1: Background and Overall Findings* (IDA Science and Technology Policy Institute 2015) 4–16.

United Kingdom-based company Surrey Satellite Technology Ltd (SSTL) offer a good example.[16] SSTL was created in 1981 by the University of Surrey as a spin-off company in the field of small satellites.[17] It is now majority-owned by Airbus Defence and Space, which has its corporate headquarters in Germany.[18] For a while – as a foreign investor – SSTL also operated a subsidiary in Englewood, Colorado in the United States. Surrey Satellite Technology-US was founded in 2008 as a satellite manufacturing facility, but in June 2017 SSTL announced that the Colorado plant would be closed to consolidate all manufacturing again in the United Kingdom.

SSTL is in the global market to assist countries that lack own capabilities in the space sector and wish to invest in this area. Offering a broad scope of products and services, SSTL 'sells satellite platforms starting at $10 million USD, instruments starting at under $1 million USD, and technology transfer packages at around $14 million USD.'[19] SSTL has acted as foreign contractor in partnership agreements, for example, with Nigeria to provide its first satellite launch programme (now implementing the second agreement) and with Algeria for a nano-satellite.[20] In such cases where relevant domestic capacity and infrastructure do not exist, SSTL – as an external commercial provider – offers both technology and expertise in the form of turnkey solutions. In other instances, for example in earlier SSTL contracts with Turkey and South Korea, SSTL could focus more on training skilled local engineers because of the existence of infrastructure and a trained workforce.[21]

Another good example for international investment in the space industry is the relationship between Richard Branson's Virgin Galactic company and the Abu Dhabi state-owned fund Aabar. Branson, a British aerospace and music entrepreneur, owns Virgin Galactic through the Virgin Group based in the United Kingdom. Virgin Galactic aims to offer suborbital flights into space for space tourists and plans to operate flights out of the Spaceport America complex in New Mexico in the United States. Virgin Galactic has its headquarters in California. In 1996, in consideration for a USD 328 million investment from

16 For the company website see <www.sstl.co.uk/> accessed 24 September 2017.

17 See Bloomberg, 'Aerospace and Defense: Company Overview of Surrey Satellite Technology Limited' (2018) <www.bloomberg.com/research/stocks/private/snapshot.asp?privcapid=7866087> accessed 24 September 2017.

18 See 'Surrey Satellite Technology' (*Wikipedia*, 6 April 2018) <https://en.wikipedia.org/wiki/Surrey_Satellite_Technology> accessed 10 June 2018.

19 Lal and others (n 15) 4–11.

20 ibid 4–12.

21 ibid (with further details).

the Abu Dhabi investment fund in Virgin Galactic, Virgin Galactic has signed a contract to build a space port in Abu Dhabi. Both Virgin Group and Aabar are foreign investors in the United States with regard to Virgin Galactic. Virgin Galactic is a foreign investor in Abu Dhabi with respect to the contract to build a space port there.

This article attempts to give an overview of the legal framework and various legal instruments that can be used to minimize political risk and protect foreign investment in the field of commercial space activities. The focus is on foreign investment and the obligations of host states to protect such investment. The analysis thus adopts a narrow concept of political risk, which corresponds to the one common in the political risk insurance industry and addressed in BITs and other IIAs. It excludes possible problems of investors with their home countries.

In the case of commercial space companies, however, there is the additional complication that such companies are not only operating in the earth segment using terrestrial infrastructure, but also make use of space infrastructure or space resources in areas which, according to international space law, are not subject to national appropriation or sovereignty claims. The question therefore is how this fact may affect the applicability and operation of foreign investment protection rules that were originally designed with terrestrial activities in mind.

The article first addresses the relevance of treaties for the protection of investment in commercial activities in space. The analysis starts with the basic legal framework laid down in the treaties governing outer space that were concluded in the 1960s and 1970s, supplemented by national space legislation (Part 2). It continues with a review of the international investment protection regime, which nowadays primarily rests on a large number of BITs and other IIAs (Part 3), and focuses on the significance of investment contracts between host states and foreign investors, licenses, insurance and arbitration as instruments for the protection of investments in commercial space activities against political risk. Part 4 concludes.

2 The Outer Space Treaties and National Space Legislation

This Part will provide a general overview of the existing international and national legal framework governing outer space activities. It will also highlight some of the basic problems for private investment in business related to the commercial exploitation of outer space.

2.1 *The General Framework*

First, it is useful to provide an overview of the general international legal framework that governs space activities,[22] focusing on its relevance for private commercial operators and foreign investment in this area.[23]

Following the launch of Sputnik 1 in 1957, a series of resolutions of the UN General Assembly laid down basic principles[24] that subsequently led to the adoption, between 1967 and 1979, of the five major multilateral treaties governing the use of outer space: the 1967 Outer Space Treaty;[25] the 1968 Astronauts

22 Ram S Jakhu and Paul S Dempsey (eds), *Routledge Handbook of Space Law* (Routledge 2017); Craig Cruzen and others (eds), *Space Operations: Contributions from the Global Community* (Springer Nature 2017); Frans von der Dunk and Fabio Tronchetti (eds), *Handbook of Space Law* (Edward Elgar 2015); Stephan Hobe and Nicolai Ruckteschell (eds), *Kölner Kompendium des Luftrechts*, vols 1–3 (Carl Heymanns 2009–2015); Peter Malanczuk, 'Space Law as a Branch of International Law' (1994) 25 NYIL 143–80; Karl-Heinz Böckstiegel and Marietta Benkö (eds), *Space Law: Basic Legal Documents*, vols 1–5 (Martinus Nijhoff 1990–2010).

23 Peter van Fenema, 'Legal Aspects of Launch Services and Space Transportation' in Dunk and Tronchetti (n 22) 382–455; Walter Peeters and Claire Jolly, 'Evaluation of Future Space Markets, Final Report' (2004) <www.oecd.org/futures/space/31825129.pdf> accessed 24 September 2017; Peter Malanczuk, 'The Relevance of International Economic Law and the World Trade Organization (WTO) for Commercial Outer Space Activities' in Susanne Reif (ed), *Legal Framework for Privatising Space Activities: Project 2001 Working Group on Privatisation; Proceedings of the Project 2001 Workshop on Legal Issues of Privatising Space Activities, 19 July 1999, Vienna, Austria* (Institute of Air and Space Law 1999) 40–51; Peter Malanczuk, 'Actors: States, International Organizations, Private Entities' in Gabriel Lafferranderie and Daphné Crowther (eds), *Outlook for Outer Space Law over the Next 30 Years. Essays Published for the 30th Anniversary of the Outer Space Treaty* (Kluwer Law International 1997) 23–36; Peter Malanczuk, 'Independent Private Enterprise and Satellite Communications – The Evolving European Framework' (1995) 13 Space Communications – An International Journal 269–74.

24 Such as the recommendatory UN Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, UNGA Res 1962 (XVIII) (13 December 1963) in Böckstiegel and Benkö, vol 1 (n 22) A.I.3.

25 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (opened for signature 27 January 1967, entered into force 10 October 1967) UNGA Res 2222 (XXI) (19 December 1966) Annex.

Rescue Agreement;[26] the 1972 Liability Convention;[27] the 1974 Registration Convention;[28] and the 1979 Moon Treaty.[29]

Some other special treaties deal with certain aspects of space-based activities, such as the 1963 Nuclear Test Ban Treaty;[30] the 1977 Environmental Modification Treaty;[31] and the Convention and Regulations of the International Telecommunication Union (ITU) with respect to the use of the geostationary orbit 36,000 km above the equator and radio frequencies for space communications.[32]

When space treaty-making became more difficult for political reasons (largely due to the North-South conflict), subsequent instruments were adopted as non-binding resolutions of the UN General Assembly, for example, the controversial 1982 Principles on Direct Satellite Television Broadcasting;[33] the

26 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (opened for signature 22 April 1968, entered into force 3 December 1968) UNGA Res 2345 (XXII) (19 December 1967) Annex.

27 Convention on International Liability for Damage Caused by Space Objects (opened for signature 29 March 1972, entered into force 1 September 1972) UNGA Res 2777 (XXVI) (29 November 1971) Annex.

28 Convention on Registration of Objects Launched into Outer Space (adopted 12 November 1974, entered into force 15 September 1976) 1023 UNTS 15. See Alexander Soucek, 'Legal and Practical Questions in Applying Articles II and IV of the Registration Convention' (2016) 65 Zeitschrift für Luft- und Weltraumrecht 22–43.

29 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (opened for signature 18 December 1979, entered into force 11 July 1984) 1363 UNTS 3.

30 Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water (adopted 5 August 1963, entered into force 10 October 1963) 480 UNTS 43.

31 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (adopted 10 December 1976, opened for signature 18 May 1977, entered into force 5 October 1978) 1108 UNTS 151.

32 For relevant documents relating to the ITU see Böckstiegel and Benkö, vol 3 (n 22) C.IV. See further Frans von der Dunk, 'Legal Aspects of Satellite Communications' in Dunk and Tronchetti (n 22) 456–500; Stephan Hobe, 'Geostationary Orbit' in Rüdiger Wolfrum (ed), *Max Planck Encyclopedia of Public International Law* (online edn, OUP 2007); Peter Malanczuk, 'Telecommunications, International Regulation of [with Addendum 1999]' in Rudolf Bernhardt (ed), *Encyclopedia of Public International Law*, vol IV (North Holland – Elsevier 2000) 791–808.

33 Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, UNGA Res 37/92 (10 December 1982) UN Doc A/RES/37/92. See also Dunk, ibid; Francis Lyall, 'Satellite Broadcasting' in Wolfrum (n 32); Peter Malanczuk, 'Das Satellitendirektfernsehen und die Vereinten Nationen [Satellite Direct Television Broadcasting and the United Nations]' (1984) 44 Heidelberg Journal of International Law 257–89. The Principles were controversial because Western states were opposed to the

1986 Principles on Remote Sensing of the Earth from Outer Space;[34] and the 1992 Principles on the Use of Nuclear Power Sources in Outer Space.[35]

2.2 *The 1967 Outer Space Treaty*

The 1967 Outer Space Treaty lays down the basic public international law framework for outer space activities. As of July 2017, it has been ratified by 107 states. Another 23 states have signed the treaty, but have not completed ratification. One of its main provisions – most of which are also considered to reflect customary international law – says that, while outer space is free for exploration and use by all states (Article I), '[o]uter space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means' (Article II).[36]

In this context, the use of the adjective 'national' is ambiguous and has given rise to claims that the Moon (or parts thereof) may be appropriated by private natural or legal persons other than states or inter-governmental organizations.[37] The business model of some private ventures offering to 'sell'

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requirement of prior consent of receiving states to the transmission of satellite television broadcasting, as well as to any principle of state responsibility limiting media freedom.

34 Principles Relating to Remote Sensing of the Earth from Outer Space, UNGA Res 41/65 (3 December 1986) UN Doc A/RES/41/65. See Fabio Tronchetti, 'Legal Aspects of Satellite Remote Sensing' in Dunk and Tronchetti (n 22) 501–53; Mahulena Hofmann, 'Remote Sensing' in Wolfrum (n 32); Peter Malanczuk, 'Erdfernerkundung [Remote Sensing]' in Karl-Heinz Böckstiegel (ed), *Handbuch des Weltraumrechts* (Carl Heymanns 1991) 425–55; Peter Malanczuk, 'Satelliten-Fernerkundung der Erde: Politische und rechtliche Aspekte [Remote Sensing by Satellites: Political and Legal Aspects]' in Karl Kaiser and Stephan von Welck (eds), *Weltraum und internationale Politik* (R Oldenbourg Verlag 1987) 57–71.

35 Principles Relevant to the Use of Nuclear Power Sources in Outer Space, UNGA Res 47/68 (14 December 1992) UN Doc A/RES/47/68. The controversial Convention on International Interests in Mobile Equipment (adopted 16 November 2001, entered into force 1 March 2006) 2307 UNTS 285 (Cape Town Convention) with the Protocol on Matters Specific to Space Assets (adopted 9 March 2012) <www.unidroit.org/instruments/security-interests/space-protocol> accessed 10 June 2018 (Berlin Protocol) could also be mentioned, see Mark Sundahl, *The Cape Town Convention: Its Application to Space Assets and Relation to the Law of Outer Space* (Nijhoff 2013); Mark Sundahl, 'Financing Space Ventures' in Dunk and Tronchetti (n 22) 874–909.

36 Philip De Man, *Exclusive Use in an Inclusive Environment: The Meaning of the Non-Appropriation Principle for Space Resource Exploitation* (Springer 2016); José Monserrat Filho, 'Outer Space as Private Property and Theater of War?' in Patricia M Sterns and Leslie I Tennen (eds), *Private Law, Public Law, Metalaw and Public Policy in Space: A Liber Amicorum in Honor of Ernst Fasan* (Springer 2016) 123–44.

37 Mahulena Hofmann, 'Moon and Celestial Bodies' in Wolfrum (n 32) paras 12–15. The Moon Treaty explicitly excludes such private claims in Article 11(3), but it has two limited exceptions to the non-appropriation principle for state parties in Article 6(2). The Moon

plots on the Moon,[38] however, does not constitute state practice and by itself cannot have an impact on customary international law as it stands.[39]

The Outer Space Treaty further stipulates that the exploration and use of outer space must be carried out for the benefit of all countries, 'irrespective of their degree of economic or scientific development, and shall be the province of all mankind' (Article I). Such activities must be in accordance with international law and the UN Charter (Article III). Article IV lays down rules prohibiting nuclear weapons and other weapons of mass destruction in outer space and determines that the use of the moon and other celestial bodies must be 'exclusively for peaceful purposes.' In emergency cases, special assistance needs to be given to astronauts (described as 'envoys as mankind in outer space') (Article V).

The Outer Space Treaty and the subsequent space treaties are all state-centric and do not pay much attention to private (or non-governmental) actors. Initially, the Soviet Union was strongly against allowing non-governmental entities to engage in space activities. Ultimately, a compromise was worked out with the United States and the 1967 Outer Space Treaty permits activities by private operators. At the same time, the treaty imposes international responsibility on state parties for 'national activities in outer space, including non-governmental entities,' to ensure that they are carried out in conformity with the treaty obligations (Article VI). In addition, the treaty states that the relevant activities of non-governmental entities 'shall require authorization and continuing supervision by the appropriate State Party' (Article VI). This provision is a rare extension of state responsibility to the conduct of private individuals or companies, which under customary international law normally does not cover such conduct.[40]

Unfortunately, the term 'national activities' is not entirely clear. The term 'appropriate state' is also not defined by the treaty and there are conflicting views on its meaning in the literature.[41] Some argue the 'appropriate state'

Treaty, however, has only a very limited significance in view of the small number of state parties (see below).

38 See 'Extraterrestrial Real Estate' (*Wikipedia*, 16 May 2018) <https://en.wikipedia.org/wiki/Extraterrestrial_real_estate> accessed 10 June 2018.

39 Hofmann (n 37) para 23.

40 See Peter Malanczuk, *Akehurst's Modern Introduction to International Law* (7th edn, Routledge 1997) 259.

41 On this and the following see ibid 205 (with further references). For a full discussion and references see Frans G von der Dunk, 'The Origins of Authorisation: Article VI of the Outer Space Treaty and International Space Law' *Space, Cyber, and Telecommunications Program Faculty Publications 69* (2011) <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1068&context=spacelaw> accessed 10 June 2018.

should not be the state of nationality of the space company or space entrepreneur, but rather the state having territorial jurisdiction over the launch. Given that several states can be involved in one and the same space activity, it seems that the better view is to accept that all states involved, including the launching state(s), can be 'appropriate states.' If the matter concerns space activities of a foreign private enterprise, this would imply that both the state from whose territory the space activity is being conducted, as well as – if different – the state of nationality of the company involved would qualify.[42]

A state which launches (or authorizes the launching of) an object into outer space is liable for any damage caused by that object (Article VII). States retain jurisdiction and control over objects launched into outer space on their registry, as well as over any personnel on board; ownership over such objects is also not affected (Article VIII). Space activities may not contaminate the environment of the Earth or celestial bodies and may also not interfere with the activities of other states in outer space (Article IX). States are required to cooperate and disclose information about their activities in outer space (Article X–XII).

The rules set out in Articles V, VII and VIII were then elaborated in more detail in the later 1968 Rescue Agreement, the 1972 Liability Convention, and the 1974 Registration Convention.

2.3 *The 1979 Moon Treaty*

The 1979 Moon Treaty applies to the Moon and other celestial bodies (not defined, but usually understood as all natural – non-man-made – objects), including their orbits (Article 1(2)).[43] It excludes the Earth and 'extraterrestrial materials' reaching the surface of the Earth 'by natural means' (Article 1(3)). Corresponding to the state-centric approach adopted in the 1967 Outer Space Treaty, the 1979 Moon Treaty addresses solely states and international organizations created by states (Article 16).

International responsibility for space activities rests only with states and inter-governmental organizations (Arts 14 and 16), 'whether such activities are carried out by governmental agencies or by non-governmental entities;' they are responsible 'for assuring that national activities are carried out' in conformity with the Moon Treaty (Article 14(1)). States must also 'ensure that non-governmental entities under their jurisdiction shall engage in activities on the

42 Marco Pedrazzi, 'Outer Space, Liability for Damage' in Wolfrum (n 32) paras 1–3.

43 See Hofmann (n 37); Fabio Tronchetti, 'Legal Aspects of Space Resource Utilization' in Dunk and Tronchetti (n 22) 769–813; Fabio Tronchetti, *The Exploitation of Natural Resources of the Moon and Other Celestial Bodies: A Proposal for a Legal Regime* (Nijhoff 2009); Virgiliu Pop, *Who Owns the Moon? Extraterrestrial Aspects of Land and Mineral Resources Ownership* (Springer 2009).

moon only under the authority and continuing supervision of the appropriate State Party' (Article 14(1)).

In harmony with the Outer Space Treaty, the Moon Treaty confirms for the Moon and other celestial bodies the principle of non-appropriation 'by any claim of sovereignty, by means of use or occupation, or by any other means' (Article 11(2)). But it goes beyond the Outer Space Treaty in explicitly clarifying in Article 11(3), that this applies also to private individuals and companies:

> [n]either the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental organization or non-governmental entity or of any natural person.[44]

However, a 'without prejudice' reservation is made regarding the provisions on the international regime mentioned in Article 11(5) of the Moon Treaty 'govern[ing] the exploitation of the natural resources of the moon as such exploitation is about to become feasible.'

The Moon Treaty further includes provisions dealing with the application of international law to '[a]ll activities on the moon, including its exploration and use' (Article 2); the peaceful use and non-militarization of the Moon and other celestial bodies (Article 3); freedom of scientific investigation (Article 6); the right of states to explore and use the Moon 'anywhere on or below its surface' (Article 8); the right to establish manned and unmanned stations on the Moon (Article 9); and issues of environmental protection (Article 7). Similar to Article VIII of the Outer Space Treaty, the Moon Treaty stipulates that states 'retain jurisdiction and control over their personnel, vehicles, equipment, facilities, stations, installations on the moon' (Article 12(1)).[45]

The most interesting provisions for the purposes of this article concern the impact of Articles 4 and 11 of the Moon Treaty on commercial space mining enterprises. Similar to Article I(1) of the Outer Space Treaty, Article 4 of the Moon Treaty declares that the 'exploration and use of the moon shall be the province of all mankind and shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development'

44 The same provision further clarifies that no right of ownership can arise from placing 'personnel, space vehicles, equipment, facilities, stations and installations on or below the surface of the Moon, including structures connected with its surface or subsurface' (art 11(3)).

45 Article 12(1) also clarifies that 'the ownership of space vehicles, equipment, facilities, stations, and installations shall not be affected by their presence on the moon.'

(Article 4(1)). Article 11(1) then goes a step further and declares that the Moon and its natural resources 'are the common heritage of mankind.'

This principle, introduced in 1967 by Malta's Ambassador A. Pardo, had first emerged in the discussion of the highly controversial internationalized deep seabed mining regime of the United Nations Law of the Sea Convention (UNCLOS).[46] Similarly, in the Moon Treaty the common heritage of mankind principle is explicitly linked to the undertaking of states parties in Article 11(5) to establish an international regime 'to govern the exploitation of the natural resources of the moon as such exploitation is about to become feasible.'[47]

State parties are obliged to inform the United Nations (UN) Secretary-General 'to the greatest extent feasible and practicable, of any natural resources they may discover on the moon' (Article 11(6)). The principle of 'equitable sharing by all State Parties in the benefits derived from those resources' is also clearly stated (Article 11(7)). One needs to bear in mind that the provisions relating to the moon also apply to other celestial bodies within the solar system (Article 1(1)) – unless there are specific legal arrangements for them. Therefore, the international regime for the Moon is designed to include such celestial bodies as well.

Due to strong opposition from the United States and other space nations, the international regime envisaged in Article 11(5) of the Moon Treaty remained controversial. While a solution to the corresponding dispute on the deep seabed mining regime under UNCLOS was eventually found with the 1994 Agreement Relating to the Implementation of Part XI of the Convention[48] (although the United States still has not yet ratified UNCLOS), the international regime for exploiting the natural resources of the Moon and other celestial bodies was never established.

The Moon Treaty has been ratified only by a small number of states, none of which is a major space power. As of November 2016, the treaty was binding only for 17 states (Australia, Austria, Belgium, Chile, Kazakhstan, Kuwait, Lebanon, Mexico, Morocco, the Netherlands, Pakistan, Peru, Philippines, Saudi Arabia, Turkey, Uruguay, and Venezuela). It has been signed by, but is not in force for, four more states (France, Guatemala, India, and Romania). France and India are important space powers, but they are still not bound by the Moon Treaty.

46 Rüdiger Wolfrum, 'Common Heritage of Mankind' in Wolfrum (n 32); Kemal Basler, *The Concept of the Common Heritage of Mankind in International Law* (Nijhoff 1998).

47 For differences between the Moon Treaty and UNCLOS Part XI in the application of the common heritage of mankind principle, see Wolfrum, ibid paras 15 and 20.

48 Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (adopted 28 July 1994, provisionally entered into force 16 November 1994, and definitively 28 July 1996) 1836 UNTS 3.

While many argue that the Moon Treaty is a failed treaty, it is interesting to note that there have been accessions as recently as 2012 by Saudi Arabia and Turkey, 2014 by Kuwait, and 2016 by Venezuela. Perhaps the Moon Treaty is becoming more interesting again for states concerned about the impact of the accelerating commercialization of outer space. Recently, the European Space Agency (ESA) has announced its interest in a permanent lunar colony to replace the current International Space Station (ISS), which will close down in 2024.[49] In cooperation with the Russian space agency Roscosmos, the National Aeronautics and Space Administration (NASA) also plans to construct a space basis on the Moon as part of a programme named Deep Space Gateway.[50]

On the long run, such projects and technological developments may inspire attempts to reform and update the defunct Moon Treaty, especially if attractive natural resources (e.g. helium-3) that become economically feasible to exploit are found on the Moon. This will move to the forefront the need for an agreement on international regulations governing the exploration and exploitation of the Moon and other celestial bodies that may provide sufficient legal certainty and predictability to encourage private enterprise to invest in such activities.

Such an agreement – either reforming the Moon Treaty, or substituting it – could draw upon lessons from the principles and rules laid down in the revised Seabed Regime in the 1994 Agreement on Part XI of UNCLOS;[51] the 1988 Antarctic Mineral Resources Convention;[52] the ITU system for regulating the geostationary orbit;[53] the 1998 International Space Station Agreement,[54] and also the network of BITs and other IIAs.[55]

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49 'Establishing a Village on the Moon May be the Next Step to Exploring Mars, European Space Agency Says' (*South China Morning Post*, 29 September 2017) <www.scmp.com/news/world/europe/article/2113271/next-step-exploring-mars-may-be-establishing-village-moon-european> accessed 29 September 2017.

50 ibid.

51 See supra n 48.

52 Convention on the Regulation of Antarctic Mineral Resource Activities (adopted 2 June 1988, did not enter into force) <http://sedac.ciesin.columbia.edu/entri/texts/acrc/cramra.txt.html> accessed on 26 May 2018.

53 For an overview see Lawrence D Roberts, 'A Lost Connection: Geostationary Satellite Networks and the International Telecommunication Union' (2000) 15 Berkeley Technology Law Journal 1095–1144.

54 Agreement Among the Government of Canada, Governments of Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America Concerning Cooperation on the Civil International Space Station (adopted 29 January 1998) <www.state.gov/documents/organization/107683.pdf> accessed 26 May 2018.

55 For a discussion see Timothy G Nelson, 'The Moon Agreement and Private Enterprise: Lessons from Investment Law' (2011) 17 ILSA JICL 393–416. See also Fabio Tronchetti,

2.4 *The Role of National Space Legislation*

While the aforementioned outer space treaties lay down the basic international framework for outer space activities in general, there is another practically important dimension of regulation of space activities at the level of national legislation. A recent study by Paul Dempsey counts at least 26 countries or territories that have meanwhile adopted special national space legislation and imposed regulatory requirements on commercial activities in outer space.[56] Such national laws differ in many respects, but they usually establish national regulatory space agencies with jurisdiction to license and control private space operators.

In part, these measures on the domestic level seek to comply with the international obligation to authorize and supervise private actors under Article VI of the Outer Space Treaty. The general attitude of international law to national law is that, unless there is a specific treaty obligation to the contrary, it leaves it to the discretion of states how to implement their obligations in their domestic legal systems, whether through legislation, administrative acts or individual decisions. This is known as an 'obligation of result' as distinct from an 'obligation of conduct,'[57] which, generally speaking, is a reflection of the respect under international law of the right of states to regulate their own internal affairs.

This distinction is also relevant for space treaty obligations. It is up to states whether to adopt any kind of special space statute, or whether they prefer to comply with their space treaty obligations through other means. But it is difficult to conceive how authorization and continuing state supervision over private space activities, which are required under Article VI of the Outer Space Treaty, can be effectively ensured without some form of domestic regulation. Motives for adopting national space laws include the aims to protect health and safety and property of nationals; to protect the environment; to offer more legal predictability and certainty for space commercialization; and to facilitate equity investment and finance of commercial space enterprise.[58]

'Legal Aspects of Space Resource Utilization' in Dunk and Tronchetti (n 22) 769–813.

56 Dempsey (n 4). See further Irmgard Marboe, 'National Space Law' in Dunk and Tronchetti (n 22) 127–204. For China see Zhao Yun, *National Space Law in China: An Overview of the Current Situation and Outlook for the Future* (Nijhoff 2015).

57 See Rüdiger Wolfrum, 'Obligation of Result versus Obligation of Conduct: Some Thoughts About the Implementation of International Obligations' in Mahnoush H Arsanjani and others (eds), *Looking to the Future – Essays on International Law in Honor of W Michael Reisman* (Brill 2010) 363–84.

58 Dempsey (n 4) 4.

Still, the 26 countries with national space laws represent less than 15% of the membership of the UN and less than half of the nations that are engaged in space activities.[59] Notably, according to one source, in 2013 there were already 58 states spending money on outer space.[60] Other studies find that some 80 countries already engage in space activities in one form or another.[61]

While countries like the United States and Australia have produced comprehensive and elaborate regulatory national space legislation, other countries are content with rather short statutes (e.g. Norway and Ireland).[62] Surprisingly, some states like India, which is among the top 10 of space nations, have no proper law in this regard at all.[63] Of course, contract law, tort law and other ordinary branches of law apply in India to launch and other space activities.[64] Even Canada lags behind; it has no public law on private space activates, apart from remote sensing, because it prefers to leave matters to industry for self-regulation.[65]

As Dempsey has shown,[66] the scope of application of national laws also varies considerably. There are states that do not bother to regulate commercial space activities by their own nationals if they operate from the high seas or the territory of another country. They just care about their own territorial jurisdiction, and do not exercise personal jurisdiction based on nationality in such cases. Other states refrain from regulating space activities of non-nationals even if they occur in the territory of that state. Another group of countries, including Australia, Russia, South Africa, and the United States, prefers to exercise broad jurisdiction extending beyond control based upon territorial jurisdiction. Dempsey concludes that perhaps the most comprehensive claim to regulate is made by France 'which imposes national jurisdiction on any type of person engaging in space activities so long as there is a French connection.'[67]

59 For the numbers see ibid 15, fn 61 (with further references).

60 Space Foundation (n 5).

61 Bhavya Lal and others, 'Global Trends in Space, Vol 1: Background and Overall Findings' *IDA Science & Technology Policy Institute Paper P-5242, vol 1* (June 2015) 3–1 (with reference to a 2014 Euroconsult report) <www.ida.org/idamedia/Corporate/Files/Publications/STPIPubs/2015/p5242v1.ashx> accessed 10 June 2018.

62 Dempsey (n 4) 43.

63 ibid 42 and 28 ('India has no law providing for the extraterritorial application of its space activities.').

64 See ibid 43, fn 269 with further references.

65 ibid 42.

66 ibid 28.

67 ibid.

Having discussed the general legal framework governing outer space activities, the article will now highlight some main problems confronting private space enterprise due to deficits of the space law regime.

2.5 *Inadequacy of the Space Law Regime for Private Space Enterprise*

It is generally recognized that the current space law regime does not adequately meet the needs of private enterprise and the commercialization of space activities.[68] Partly, this is due to the fact that since the conclusion in 1979 of the last of the five major multilateral space treaties (the Moon Treaty), states have not been able to agree on any revision of the regime or on a new multilateral treaty. Space law treaty-making has long ago ground to a halt. Piecemeal developments have replaced it, mostly by adopting only non-binding sectoral 'soft law' instruments, such as principles on satellite direct television broadcasting, remote sensing, the use of nuclear power sources, and other sectors.[69] In fact, as noted above, the practically most relevant development of the law relating to outer space activities is currently taking place on the domestic level through national space legislation in particular addressing questions of space mining.[70] But this national legislation is disparate.

Criticism of the space law regime from the perspective of private enterprise focuses on the lack of sufficient predictability and legal certainty to the extent required by private space companies and their financiers for properly evaluating both political and business risk of private investment. There are also a number of issues relating to the extent to which states can exercise jurisdiction with respect to space-related activities. As noted by Stephan Hobe, in space-related ventures, issues concerning jurisdiction include:

> joint commercial launches from the *high seas* such as from SeaLaunch, questions of jurisdiction over hybrid space vehicles such as the space plane, especially those with a commercial purpose such as those built by SpaceShipOne and in production by various commercial space flight providers. With the economic potential and rapid technological advances relating to space objects, international space law must develop creatively

68 For challenges to space commercialization from a regulatory point of view see, for example, Joshua Hampson, 'The Future of Space Commercialization' Niskanen Center Research Paper (2017) <https://niskanencenter.org/wp-content/uploads/2017/01/TheFutureofSpaceCommercializationFinal.pdf> accessed 10 June 2018.

69 See Irmgard Marboe, *Soft Law in Outer Space – The Function of Non-Binding Norms in International Space Law* (Böhlau 2012).

70 Dempsey (n 4) 5.

> to ensure that the rule of law is not left in the dust of the commercial exploitation of outer space.[71]

Against this background, the following issues are important to address in assessing political risk in respect of space-related activities: the need for harmonizing national space laws; the lack of international rules on safety and navigation of aerospace vehicles; the lack of delimitation of air space and outer space; the absence of clear property rights for space mining and space resource exploitation; and the problem of space debris. The diversity of national space legislation in licensing and regulation calls for harmonization; at the same time, national enactments are also required where national legislation is absent or incomplete.[72] This is especially true for common standards for safety and navigation to reduce safety risks. Moreover, harmonization of national space laws among states is required to reduce the danger of forum-shopping (or 'flag-of-convenience'-type competition). Commercial space companies, which increasingly operate on a global level, are being lured by incentives to certain jurisdictions, such as Luxembourg. As recently noted by one author: 'It would be shameful if commercial space activities were attracted to the jurisdictions with the lowest taxes and lowest cost regulatory structure, at the expense of safety and environmental harm.'[73]

Increasing space traffic with a multitude of public and private actors leads to congestion and the risk of more traffic accidents. On the international level, there is still no regulatory regime dealing with safety and navigation of aerospace vehicles. The necessary international space traffic management regime for regulating aerospace vehicles (especially for sub-orbital flight) could follow the model of what was achieved almost 75 years ago for aviation safety and navigation with the 1944 Chicago Convention.[74] Some commentators have suggested that the International Civil Aviation Organization (ICAO) should take care of this task for space activities, and there have been some studies, but so far, no initiative has been taken by an international body.[75]

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71 Stephan Hobe, 'Spacecraft, Satellites and Space Objects' in Wolfrum (n 32) para 17 (emphasis in the original).

72 Dempsey (n 4) 43.

73 ibid.

74 See ibid 44, fn 274.

75 ibid 4–5 and 13–14, noting that the 1944 Chicago Convention 'may apply to vehicles transporting space objects through air space. But to date, ICAO has promulgated no Standards and Recommended Practices governing aerospace vehicles or rockets, though in time, it may. This creates a regulatory void for air traffic management of the launch of space objects as they pass through air space that, at present, only States can regulate.'

Another issue relevant for the assessment of political risk with respect to space-related activities is the lack of agreement on the delimitation between air space (under sovereignty) and outer space (governed by the principle of the freedom of outer space).[76] This is becoming more and more of a practical problem in view of the plans of some companies to invest in offering suborbital flights.[77] It is generally recognized in international law that states have exclusive jurisdiction over the airspace directly above their territory and territorial sea.[78] Overflight by other states is not permitted, unless there is an agreement. While the idea that sovereignty must end where outer space begins is also generally accepted, there is no consensus where exactly the line between air space and outer space must be drawn.

While there is still no international agreement on this issue, unilateral initiatives have started in national space legislation. The 1998 Australian Space Activities Act (as amended in 2002) seems to be the forerunner. For space regulation, it refers to the distance of 100 km above mean (or average) sea level,[79] below which Australia would seem to claim sovereign air space.

For companies interested in commercial space mining and space resources exploitation, a central issue has always been the lack of clear property regime in outer space.[80] As discussed above, this is controversial in view of the bar to sovereignty claims and the acceptance of the non-appropriation principle in

76 See Andrea J DiPaolo, 'The Definition and Delimitation of Outer Space: The Present Need to Determine Where "Space Activities" Begin' (2014) 39 Annals of Air and Space Law 623–44; Gbenga Oduntan, *Sovereignty and Jurisdiction in the Airspace and Outer Space: Legal Criteria for Spatial Delimitation* (Routledge 2012).

77 See Frans von der Dunk, 'Legal Aspects of Private Manned Spaceflight' in Dunk and Tronchetti (n 22) 662–716.

78 See Convention on International Civil Aviation (adopted 7 December 1944, entered into force 4 April 1947) 15 UNTS 295 (Chicago Convention) art 1; Stephan Hobe, 'Airspace' in Wolfrum (n 32).

79 Space Activities Act 1998 (Commonwealth) s 8 <www.legislation.gov.au/Details/C2004C01013> accessed 24 September 2017; see Vladen Vereshchetin, 'Outer Space' in Wolfrum (n 32) para 17.

80 See Ram S Jakhu, Joseph N Pelton and Yaw Otu Mankata Nyampong, *Space Mining and Its Regulation* (Springer 2017); Stephan Hobe, 'The International Institute of Space Law Adopts Position Paper on Space Resource Mining' (2016) 65 Zeitschrift für Luft- und Weltraumrecht 204–9; Fabio Tronchetti, 'Legal Aspects of Space Resource Utilization' in Dunk and Tronchetti (n 22) 769–813; Jonathan Babcok, 'Encouraging Private Investment in Space: Does the Current Space Law Regime Have to Be Changed?: Part 1' (5 January 2015) <www.thespacereview.com/article/2669/1>; and Jonathan Babcok, 'Encouraging Private Investment in Space: Does the Current Space Law Regime Have to Be Changed?: Part 2' (12 January 2015) <www.thespacereview.com/article/2675/1> both accessed 24 September 2017; Ricky J Lee, *Law and Regulation of Commercial Mining of Minerals in Outer Space* (Springer 2012).

the Outer Space Treaty and customary international law. The United States and Luxembourg have recently taken steps in this regard through their domestic laws.[81] Here it will suffice to add a few comments on the property rights regime granted under the US Space Act of 2015 and its significance for foreign investment.[82] The relevant text in Section 51303 addressing 'Asteroid Resource and Space Resource Rights' says:

> A U.S. citizen engaged in commercial recovery of an asteroid resource or a space resource shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell it according to applicable law, including U.S. international obligations.

But the United States also added a 'Disclaimer of Extraterritorial Sovereignty' in Section 403, which states as follows:

> It is the sense of Congress that the United States does not, by enactment of this Act, assert sovereignty or sovereign or exclusive rights or jurisdiction over, or ownership of, any celestial body.

Moreover, it should be noted that the legislation states the following:

> In this chapter –
> (1) 'citizen of the United States' means –
> (A) an individual who is a citizen of the United States;
> (B) an entity organized or existing under the laws of the United States or a State; or
> (C) an entity organized or existing under the laws of a foreign country if the controlling interest (as defined by the Secretary of Transportation) is held by an individual or entity described in subclause (A) or (B) of this clause.

The wording seems to imply that under (B) a company lawfully established in the United States by a foreign investor (and of course admitted by passing

81 See Mahulena Hofmann and PJ Blount, 'Emerging Commercial Uses of Space: Regulation Reducing Risks' (2018) 19 JWIT 1001 (in this Special Issue).

82 Public Law No 114–90 (11/25/2015) <www.congress.gov/bill/114th-congress/house-bill/2262> accessed 24 September 2017. The space mining property rights legislation adopted by the United States in 2015 is laid out in the US Commercial Space Launch Competitiveness Act (also called Spurring Private Aerospace Competitiveness and Entrepreneurship Act of 2015 or the Space Act of 2015).

national security review) could also make use of property rights protected under this Act. This would be conducive to attracting foreign investment.

The 2015 US Space Act is a mixed blessing in this regard. On the one hand, it seems difficult to see how the unilateral extension of legislative jurisdiction and domestic property title to asteroid resources or a space resource obtained can be reconciled with the Outer Space Treaty. Even if one could argue that the Act does not directly contradict the wording of the treaty, the uncomfortable gut feeling remains that the spirit of the treaty aiming to protect outer space as part of the 'international commons' from national appropriation is not respected by legislation permitting space mining and recognizing that title to mining products ultimately falls to a private company (see Articles I and II). On the other hand, however, the US initiative (as well as Luxembourg's) may spur international discussion on the need for a broader international agreement on the exploitation of space resources.

Finally, another important unresolved problem for all space activities, whether commercial or not, arises from the increasing danger of collision with space debris (or orbital debris).[83] The term refers to man-made space objects (or junk) that are no longer functional or have fragmented into smaller parts and pieces, but remain in orbit. Almost 18,000 of such items were tracked in 2016.[84] While mitigation and removal options have been discussed in international fora since many years, there is still no binding international regulation on the issue.

Space debris is a growing problem that becomes worse with increasing space activities, including more commercial launches and operations. On the long run, it poses an additional serious risk factor for military or civil operators, as well as foreign or domestic commercial space companies, whether state or private owned, alike.

In sum, the above analysis has shown that the space treaties are state-centered and fail to provide an adequate legal framework for private commercial actors in outer space. Implementing national space legislation – where it exists – needs to be harmonized. The space law regime suffers from a number of regulatory inadequacies that produce a significant lack of legal certainty

83 See Lotta Viikari, 'Environmental Aspects of Space Activities' in Dunk and Tronchetti (n 22) 717–68; Vereshchetin (n 80) paras 18–28; Peter Malanczuk, 'Outer Space' (1998) 9 YB Intl Env L 258–62; Peter Malanczuk, 'Legal and Policy Aspects of Controlling Space Debris' (1996) 45 Zeitschrift für Luft- und Weltraumrecht 39–62.

84 Zulfikar Abbany, 'Nets 'n' Lasers: Some of Our Best Hopes for Mitigating the Threat of Space Debris' (*Deutsche Welle*, 13 April 2017) <www.dw.com/en/nets-n-lasers-some-of-our-best-hopes-for-mitigating-the-threat-of-space-debris/a-38340435> accessed 26 May 2018.

and predictability for private space enterprise and thus complicates the assessment of risk, including political risk, for commercial space activities.

3 The International Investment Protection Regime and Commercial Space Activities

This Part turns to the discussion of selected aspects of the protection of foreign investment in commercial outer space activities under international investment law. International investment law[85] is quite separate from the international space law regime discussed above. The principles and rules governing foreign investment can be found in general international law and in standards laid down in international treaties that contain specific rules on the protection of foreign investment.[86] These international principles and rules are supplemented by, and interact with, the domestic law of the host state.[87] Such norms need to balance the interests of the foreign investor with the public interests of the host state, including regulatory concerns regarding environmental, health and labour standards or national security. In the absence of a global

85 For an overview over international investment law see, for example, Surya P Subedi, *International Investment Law: Reconcilin Policy and Principle* (3rd edn, Bloomsbury 2016); David Collins, *An Introduction to International Investment Law* (CUP 2016); Marc Bungenberg, Jörn Griebel, August Reinisch and Stephan Hobe (eds) *International Investment Law. A Handbook* (Nomos 2015); Stephan W Schill, Christian J Tams and Rainer Hofmann (eds), *International Investment Law and Development: Bridging the Gap* (Edward Elgar 2015); M Sornarajah, *Resistance and Change in the International Law on Foreign Investment* (CUP 2015); Jean E Kalicki and Anna Joubin-Bret (eds), *Reshaping the Investor-State Dispute Settlement System: Journeys for the 21st Century* (Martinus Nijhoff 2015); Jeswald W Salacuse, *The Three Laws of International Investment – National, Contractual, and International Frameworks for Foreign Capital* (OUP 2013); Rudolf Dolzer and Christoph Schreuer, *Principles of International Investment Law* (2nd edn, OUP 2012); Andrea K Bjorklund and August Reinisch (eds), *International Investment Law and Soft Law* (Edward Elgar 2012); Stephan W Schill (ed), *International Investment Law and Comparative Public Law* (OUP 2010); Peter Malanczuk, 'International Law Provisions for the Protection of Foreign Investment' in Rudolf Dolzer, Matthias Herdegen and Bernhard Vogel (eds), *Foreign Investment – Its Significance in Relation to the Fight Against Poverty, Economic Growth and Legal Culture* (Konrad-Adenauer-Foundation 2006) 79–145.

86 For the role of customary international law see Dolzer and Schreuer (n 85) 1–10, with the observation at 17: 'Customary international law remains highly relevant for the practice of investment arbitration. Rules on attribution and other areas of state responsibility as well as rules on damages illustrate the point. Other relevant areas of customary international law are the rules on expropriation, on denial of justice, and on the nationality of investors'.

87 See Dolzer and Schreuer (n 85) 12.

multilateral framework, comparable to the regime set up under the auspices of the WTO for international trade, current international investment law primarily rests upon a large number BITs and other IIAs. The latter include free trade arrangements (FTAs), which recently often contain specific chapters on investment.[88]

The following sections address selected aspects of dealing with political risk of foreign investment in commercial space activities, such as national security concerns; territorial limitations of BITs; investment contracts; licenses; political risk insurance; and arbitration.

3.1 *National Security Concerns*

There is no general obligation under customary international law for any state to admit foreign investment. In their BITs, Western European countries and developing countries prefer the 'admission model', providing protection to foreign investment only after the investment has been admitted to their territory in accordance with domestic laws and regulations. Only a few countries, like the United States, Canada and Japan, support a BIT practice that extends national treatment and MFN treatment in their IIAs to the admission phase (so-called pre-establishment model).[89] Similarly, foreign investment in commercial space activities may not be covered, if the term 'investment' under an IIA is limited to investment only in certain sectors of the local economy.[90]

Even in states with a liberal admission policy, however, in view of the sensitive nature of dual-use technologies in the space industry (which is considered to be 'critical infrastructure'), foreign investment in certain commercial space activities may be precluded or limited by restrictions on foreign ownership in certain areas, such as telecommunications, including satellite communications.[91] How seriously commercial space activities may be affected in both international trade and investment by national security concerns[92] can be seen, for example, from the dispute between the United States and the European Union

88 For in-depth discussions of the content of BITs and other IIAs see supra the references in n 85.

89 Dolzer and Schreuer (n 85) 258. But see Stephan W Schill and Heather L Bray, 'The Brave New (American) World of International Investment Law: Substantive Investment Protection Standards in Mega-Regionals' (2016) 5(2) British Journal of American Legal Studies 419–48.

90 See generally UNCTAD, *Admission and Establishment, UNCTAD Series on International Investment Agreements* (United Nations 1999).

91 OECD, *Communications Outlook 2013* (OECD 2013) Table 2.5. National treatment for foreign-controlled enterprises in telecommunications.

92 For the impact of such concerns in international criminal proceedings see Peter Malanczuk, 'Trial Proceedings – Protection of National Security Interests' in Antonio

(EU) on the question of satellite export controls in connection with the strict US International Traffic in Arms Regulations (ITAR) and the 1995 Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies.[93]

In order to accommodate national security concerns, international trade and investment agreements usually provide for exceptions from the market access and national treatment obligations allowing state parties to take measures to protect security interests or public order, provided such measures do not constitute an arbitrary discrimination or disguised restriction on trade.[94] Some BITs have exception clauses protecting 'essential security' like Article 18 of the 2012 US Model BIT which states:

> Nothing in this Treaty shall be construed:
> 1. to require a Party to furnish or allow access to any information the disclosure of which it determines to be contrary to its essential security interests; or
> 2. to preclude a Party from applying measures that it considers necessary for the fulfillment of its obligations with respect to the maintenance or restoration of international peace or security, or the protection of its own essential security interests.

This is often viewed as a 'self-judging' clause at the discretion of the Contracting Party.

Furthermore, many countries have some form of screening incoming investment, including Australia, China, India, Japan, Russia and the United States, but only less than half of the EU member states do so.[95] The following will briefly look at the systems in the United States and the EU, because developments

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Cassese, Paola Gaeta and John RWD Jones (eds), *The Rome Statute of the International Criminal Court*, vol II (OUP 2002) 1371–86.

93 See Peter Malanczuk, 'Satellite Export Controls and National Security Under WTO Rules' in Mahulena Hofmann (ed), *Ownership of Satellites, 4th Luxembourg Workshop on Space and Satellites Communication Law* (Nomos 2017) 227–54.

94 It may be noted that the Statement of the European Union and the United States on Shared Principles for International Investment (2012) <http://trade.ec.europa.eu/doclib/docs/2012/april/tradoc_149331.pdf> in Principle 7 calls for 'Narrowly-Tailored Reviews of National Security Considerations: Governments should ensure that their reviews, if any, of the national security implications of foreign investments focus exclusively on genuine national security risks.'

95 See Frédéric Wehrlé and Joachim Pohl, 'Investment Policies Related to National Security: A Survey of Country Practices' *OECD Working Papers on International Investment* (2016) <http://dx.doi.org/10.1787/5jlwrrfo38nx-en> accessed 10 June 2018.

in the United States and in Europe are currently most instructive for the issue of political barriers to foreign investment in space-related technologies arising from challenges due to increasing Chinese outward investment.

3.1.1 CFIUS Foreign Investment Control in the United States

For reviewing foreign investment that may endanger national security, the Committee on Foreign Investment in the United States (CFIUS) was established in 1975.[96] The CFIUS process and the authority of the US president to block a foreign acquisition on national security grounds were broadened and strengthened in 1988 with the Exon-Florio amendment to the Defense Production Act of 1950[97] and in 2007 with the Foreign Investment and National Security Act (FINSA).[98]

According to the latest annual CFIUS report to Congress (for 2015, released with delay in September 2017), for the fourth year in a row, Mainland Chinese companies have led the number of deals screened by CFIUS, adding up to 29 of the 143 transactions scrutinized in 2015.[99]

US presidents have so far blocked foreign acquisition bids on grounds of national security only in four cases, all concerning Chinese interests: in 1989 (aircraft parts), in 2012 (wind turbine company), in 2016 (US subsidiary of a German semiconductor manufacturer), and recently in September 2017 (US semiconductor firm making programmable chips with potential military applications).[100]

Generally, there is no judicial review for such cases, but in the 2012 case the Chinese-owned Ralls Corporation challenged the legality of the presidential order to divest its interest in Oregon wind farms. The District of Columbia Court of Appeals held in 2014 that a foreign investor had the right of access to

96 See Jonathan Master and James McBride, 'Foreign Investment and US National Security' *Council on Foreign Relations Backgrounder* (March 2018) <www.cfr.org/backgrounder/foreign-investment-and-us-national-security> accessed 24 September 2017.

97 Exon–Florio Amendment 50 USC app 2170, amended Section 721 of Defense Production Act of 1950, PubL 81–774.

98 Foreign Investment and National Security Act of 2007 (PubL 110–49, 121 Stat 246, enacted July 26, 2007).

99 Bien Perez, 'China at Top of US Deals Under Security Review in 2015, Says CFIUS Report' (*South China Morning Post*, 21 September 2017) <www.scmp.com/tech/enterprises/article/2112282/china-top-us-deals-under-security-review-2015-says-cfius-report> accessed 24 September 2017.

100 'Trump Blocks Chinese Takeover of US Chip Maker on National Security Grounds' (*South China Morning Post*, 14 September 2017) <www.scmp.com/news/world/united-states-canada/article/2111095/trump-blocks-chinese-takeover-us-chip-maker-national> accessed 24 September 2017.

any unclassified information forming the basis of the decision and should have an opportunity for rebuttal.[101] The Court stressed that there were due process and transparency requirements in spite of the wide discretion of the US president in such cases.

3.1.2 EU National Security and FDI in the Space Industry

In Europe, there is no EU-wide foreign investment screening mechanism. On the national level, only 12 EU Member States have diverse mechanisms in place to review foreign investment for national security threats: Austria, Denmark, Germany, Finland, France, Latvia, Lithuania, Italy, Poland, Portugal, Spain, and the United Kingdom.[102]

In view of increasing Chinese interest in acquiring European companies in high technology sectors, as noted in a recent European Commission paper published in May 2017 on the future of the EU-27 (after Brexit), 'concerns have recently been voiced about foreign investors, notably state-owned enterprises, taking over European companies with key technologies for strategic reasons.'[103] A subsequent European Commission Communication on FDI and national security notes:

> Foreign investors are increasingly focused on seeking new markets and strategic assets and **State-Owned Enterprises play a growing role in the global economy.** In some economies State-owned Enterprises undertake a significant share of outward foreign direct investment, in some cases as part of a declared government strategy. Beyond direct state ownership in enterprises, we also witness situations whereby certain companies are directly or indirectly influenced by the state through various means, or where the state facilitates foreign take-overs by national companies, notably through facilitating access to financing below market rates.
>
> In this context, there is a risk that in individual cases **foreign investors may seek to acquire control of or influence in European undertakings whose activities have repercussions on critical technologies,**

101 Baker Botts LLP, 'US Appellate Court Raises Questions Regarding Transparency of CFIUS Process' (*Lexology*, 25 July 2014) <www.lexology.com/library/detail.aspx?g=abf2a925-9870-4d4b-a6a6-7137c4272c04> accessed 24 September 2017.

102 See European Commission Staff Working Document, 'Proposal for a Regulation of the European Parliament and of the Council Establishing a Framework for Screening of Foreign Direct Investments into the European Union' SWD(2017) 297 final (13 September 2017) 7–8.

103 European Commission, 'Reflection Paper on Harnessing Globalisation' COM(2017) 240 (10 May 2017) 15.

> **infrastructure, inputs, or sensitive information.** This risk arises especially but not only when foreign investors are state owned or controlled, including through financing or other means of direction. Such acquisitions may allow the States in question to use these assets to the detriment not only of the EU's technological edge but also its security and public order.[104]

In September 2017, the European Commission submitted a proposal for a regulation establishing a framework for screening of FDI into the EU.[105] The proposal covers only FDI and excludes portfolio investment (Article 2). The grounds for investment screening laid down in Article 1 correspond to the restrictive measures that can be introduced based on security or public order concerns pursuant to the WTO Agreement, especially Article XIV(a) and Article XIV *bis* of the GATS,[106] and in other trade and investment agreements.

It is not necessary here to further discuss in any detail the proposed screening and cooperation mechanisms in this draft regulation. It suffices to note that 'critical infrastructure, critical technologies or critical inputs' are given special attention (Article 3(3)). Among the assets at the EU level that have been identified as critical infrastructures and services, such as the Eurocontrol air traffic control system and the European electricity and gas transmission networks, are also space programmes, namely Galileo and Copernicus.[107] Galileo is the EU's Global Satellite Navigation System (GNSS), which is under civilian control.[108] Copernicus, in turn, is a European programme for the establishment of a European capacity for earth observation, previously known as GMES (Global Monitoring for Environment and Security).[109]

Thus, recent developments in both the United States and the EU demonstrate that national security concerns may result in political barriers to foreign investment in sensitive technologies, including technologies that are relevant to commercial space activities. Legally speaking, however, such barriers would normally be covered by the limited scope of applicable BITs

104 European Commission, 'Welcoming Foreign Direct Investment while Protecting Essential Interests' COM(2017)494 final (13 September 2017) 5 (emphases in the original).

105 COM(2017)487 final (13 September 2017).

106 See Malanczuk (n 143).

107 European Commission (n 106) 8. The communication announces that further studies of FDI inflows, especially in strategic sectors (eg energy, space, and transport) will be carried out by the end of 2018 (ibid 11).

108 See European Commission, 'Galileo' (2018) <http://ec.europa.eu/growth/sectors/space/galileo_en> accessed 10 June 2018. For discussion of satellite navigation systems see Lesley Jane Smith, 'Legal Aspects of Satellite Navigation' in Dunk and Tronchetti (n 22) 554–617.

109 See <www.copernicus.eu/> accessed 24 September 2017.

regarding the admission of foreign investment, or by special 'essential security' exemption clauses.

3.2 *Territorial Limitations of BITs*

One problem that remains unclear in the application of BITs to commercial space activities is the relevance of the fact that BITs generally limit the obligations of the host state to investments made in its territory.[110] The issue to be discussed here is different from the question of whether the reference to investments 'in the territory' of the host state requires a significant physical presence in the host state, such as in cases where loans or pre-shipment inspection services performed in another country are involved.[111] The discussion here assumes that the foreign-invested space company has established a physical and legal presence in the host state. The problem in those cases arises out of the fact that certain assets that serve a space-related venture are located in areas that are clearly outside of the jurisdiction and sovereignty of any state.

While the ICSID Convention merely states that '[t]his Convention shall apply to all territories for whose international relations a Contracting State is responsible,' except those which the state has excluded by written notice,[112] some investment treaties define the term 'territory'. The most common definition of 'territory' in BITs extends the concept to maritime areas where the

110 See UNCTAD, *Scope and Definition, UNCTAD Series on Issues in International Investment Agreements II* (United Nations 2011) 44.

111 See for this type of cases Dolzer and Schreuer (n 85) 76–78 and the detailed discussion in Jeswald W Salacuse, *The Law of Investment Treaties* (OUP 2015) 188–92; as well Christina Knahr, 'Investments "in the Territory" of the Host State' in Christina Binder and others (eds), *International Investment Law for the 21st Century: Essays in Honour of Christoph Schreuer* (OUP 2009) ch 5.

112 Convention on the Settlement of Investment Disputes between States and Nationals of Other States (adopted 18 March 1965, entered into force 14 October 1966) 575 UNTS 159 (ICSID Convention) art 70. The 'territorial application of treaties' raises a complex of different questions, see Marko Milanovic, 'The Spatial Dimension: Treaties and Territory' in Christian J Tams, Antonios Tzanakopoulos and Andreas Zimmermann (eds), *Research Handbook on the Law of Treaties* (Edward Elgar 2014) 186–221. The author concludes at 220:

> We have seen how the very concept of the territorial application of treaties is capable of having several different meanings and is burdened by terminological confusion. First, when it comes to territorial application as examining the space in which a particular treaty's obligations are to be performed, the prospects for further research are endless, since the variety of treaty subject-matters is equally endless, and territorial application in this sense is purely a function thereof. Thus, while some of us can write about the territorial application of human rights treaties, others can write about status of forces agreements and environmental, labour or investment treaties. This scholarship will to an extent necessarily be area-specific, and is subject to few, if any, overarching principles or generalizations.

host state may exercise some sovereign rights and jurisdiction. For example, the 2008 German Model BIT states that '"territory" refers to the area of each Contracting State including the exclusive economic zone and the continental shelf insofar as international law allows the Contracting State concerned to exercise sovereign rights or jurisdiction in these areas.'[113]

Similarly, the 2012 US Model BIT stipulates that the term 'territory' with respect to the United States means the 'customs territory of the United States, which includes the 50 states, the District of Columbia, and Puerto Rico' and 'the foreign trade zones located in the United States and Puerto Rico.'[114] In addition, for both states parties the text further includes in the definition of 'territory' the following:

> the territorial sea and any area beyond the territorial sea of the Party within which, in accordance with customary international law as reflected in the United Nations Convention on the Law of the Sea, the Party may exercise sovereign rights or jurisdiction.[115]

This implies that investments located within the maritime jurisdiction of the host state, for example facilities to explore and extract minerals or offshore oil and gas installations are covered by the BIT or other IIA, and in some cases the definition may even explicitly cover air space.[116] As noted in a study made by UNCTAD, the rationale for defining the term 'territory' in BITs 'derives from the objective of investment protection, in particular to provide that investments located in maritime areas beyond the boundaries of the territorial waters are deemed to be within the parties' territory for the purposes of the agreement.'[117]

But it seems that so far there is no example of an investment treaty that would attempt to lay down any corresponding extension of the term 'territory' to outer space, although international space law recognizes that states retain

113 German Model BIT (2008) art 1(4) ('Definitions') reprinted in Dolzer and Schreuer (n 85) 364.

114 US Model BIT (2012) art 1 ('Definitions') reprinted in Dolzer and Schreuer (n 85) 380.

115 ibid.

116 UNCTAD, *Bilateral Investment Treaties 1995–2006: Trends in Investment Rulemaking* (United Nations 2007) 17 (with examples at 18–19). (see reference to the 2004 Canadian Model BIT). See also UNCTAD (n 110) 44.

117 UNCTAD, *Bilateral Investment Treaties 1995–2006* (n 116) 17. For an examination of China's BIT practice regarding the definition of 'territory' and considering the status of Hong Kong and Macao with their competences to conclude BITs see Odysseas G Repousis, 'On Territoriality and International Investment Law: Applying China's Investment Treaties to Hong Kong and Macao' (2015) 37(1) Mich J Intl L 113–90.

jurisdiction and control over their space objects and personnel on board and further stipulates that ownership rights regarding space objects are not affected.[118] This raises interesting questions on the extent to which space assets in orbit (satellites or space stations), space colonies on the Moon or Mars, space mining activities on celestial bodies, space transport and manned space flight objects[119] in outer space are covered by a given investment protection treaty and its dispute settlement mechanisms.

One can argue that as far as a foreign space company which is located in the territory of the host state (and presumably operating the earth segment of the space activities from there) is concerned, it would make no difference in terms of the protection against breaches by the host state of BIT standards, such as national treatment, most-favoured-nation treatment, compensation for direct or indirect expropriation, fair and equitable treatment, full protection and security, and the guarantee of unrestricted transfer of investments made and returns, as long as the space objects in the space segment are on the books of the respective company. What arguably matters is only whether, from an economic and legal point of view, the investment (i.e. the company owning the assets as property and/or controlling the respective contractual rights) is situated in the territory of the host state, and whether the act interfering with the investment and thus potentially constituting a breach of the BIT is attributable to the host state. The fact that certain objects are placed outside of the host state's jurisdiction would thus be irrelevant for purposes of the scope of application of BITs.

In conclusion, the territorial limitation of IIAs appears to be the main aspect that differentiates the potential scope of protection of foreign-invested commercial space activities from non-space activities. There is a need for further research on the full implications of the lack of explicit geographical coverage of outer space in the spatial application of a given BIT or other IIA for different scenarios of commercial space applications. Space mining and space colonization projects may pose quite different issues than satellite remote sensing of the Earth or satellite television broadcasting ventures. Such questions, however, could possibly also be more specifically addressed according to the needs of the parties in an investment contract between the foreign investor and the host state.

118 See supra Section 2.2.

119 Generally, on space stations and the current International Space Station (ISS) see Carla Sharpe and Fabio Tronchetti, 'Legal Aspects of Public Manned Spaceflight and Space Station Operations' in Dunk and Tronchetti (n 22) 618–61. See also Frans von der Dunk, 'Legal Aspects of Private Manned Spaceflight' in Dunk and Tronchetti (n 22) 662–716.

3.3 *The Role of Investment Agreements (State Contracts)*

Especially in the case of large-scale and longer-term investments, the foreign investor and the host state may negotiate an investment agreement or investment contact (also called investor-state contract or simply state contract).[120] Such investment contracts vary according to the different sectors of the economy for which they are drafted.[121] They have played a key role in the oil and gas industry before 1945 in the form of concessions and, from the 1960s and 1970s onwards, in the form of production-sharing (or profit-sharing) agreements of foreign investors with state-owned companies in the nationalized energy sector. Distinct types of investment agreements developed for projects engaged with utilities and infrastructure.

An illustrative definition of the meaning of 'investment agreement' can be found in the 2012 US Model BIT:

> '**investment agreement**' means a written agreement between a national authority of a Party and a covered investment or an investor of the other Party, on which the covered investment or the investor relies in establishing or acquiring a covered investment other than the written agreement itself, that grants rights to the covered investment or investor:
>
> with respect to natural resources that a national authority controls, such as for their exploration, **extraction**, refining, transportation, distribution, or sale;
>
> to supply services to the public on behalf of the Party, such as power generation or distribution, water treatment or distribution, or telecommunications; or
>
> to undertake **infrastructure** projects, such as the construction of roads, bridges, canals, dams, or pipelines, that are not for the exclusive or predominant use and benefit of the government.[122]

Commercial space activities are not explicitly mentioned in this definition. But in case of (a) one might think of space mining projects or satellite remote sensing projects to discover terrestrial resources; regarding (b) one could perhaps include the establishment and operation of satellite communications systems; and with respect to (c) the construction and operation of a local space port

120 See UNCTAD, *State Contracts, UNCTAD Series on Issues in International Investment Agreements* (United Nations 2004); Markos Karavias, 'Treaty Law and Multinational Enterprises: More Than Internationalized Contracts?' in Tams, Tzanakopoulos and Zimmermann (n 112) 597–624.

121 Dolzer and Schreuer (n 85) 79–86.

122 2012 US Model BIT (n 114) art 1 ('Definition') (emphases in the original).

by a foreign contractor may be considered (see the Virgin Galactic-Abu Dhabi example mentioned in the Introduction).

Parties are interested in negotiating such investment agreements because they want to allocate rights and responsibilities more precisely and to distribute risks. Foreign investors seek to protect their investment contractually against arbitrary changes through host state legislation or unilateral administrative measures. The most sensitive issues include the determination of the law applicable to the agreement (choice of law-clause) and the agreement on dispute settlement. In addition, parties usually opt to include clauses on good faith, *force majeure*, and changed circumstances. As noted by Dolzer and Schreuer,

> [f]rom a legal perspective, the most complex and difficult questions often concerned the inclusion of clauses regulating the conduct of the parties in the event of political changes in the host country and in the event of changes in the economic equilibrium between the host state and the investor.[123]

While the host state will naturally prefer choices respecting its sovereignty, the foreign investor will be looking for solutions securing predictability and a neutral forum for dispute settlement. Choice of law-clauses can range from selecting the law of the host state law as applicable law to the selection of international law. As to dispute settlement, a reference to international arbitration, either under the auspices of the International Centre for Settlement of Investment Disputes (ICSID), the use of the arbitration rules of the United Nations Commission for International Trade Law (UNCITRAL), or another venue, like arbitration under the auspices of the International Chamber of Commerce (ICC), is the normal preference of foreign investors.[124] This contributes to 'internationalizing' the investment agreement and 'delocalizing' it from national legislation and host state court control.

Furthermore, in politically uncertain environments, which foreign investors may encounter in certain parts of the world, it is often advisable to include a so-called 'stabilization clause' to avoid negative changes by the host state to the original contractual agreement over time. The wording of such clauses varies, and different types can be distinguished,[125] but a helpful general description has been given by a Chamber of the Iran-United States Claims Tribunal in the

123 Dolzer and Schreuer (n 85) 80.

124 See infra Section 3.6.

125 See Salacuse (n 85) 153–54.

Amoco case. It suggests that the term 'stabilization clause' normally refers to 'contract language which freezes the provisions of a national system of law chosen as the law of the contract as to the date of the contract in order to prevent the application to the contract of any future alterations of this system.'[126]

3.4 *Licenses*

Licenses issued by governments are also used to control political risk relating to commercial space activities in several respects. As a starting point, they may be essential as licenses required by national space legislation for the planned space activity. Other licenses may be required in addition to run a business in general, and/or a permit to enter the country as a foreign investor. Finally, they can be relevant in terms of investment protection after admission of the foreign investor.

Most states with space activities have introduced license requirements to control such activities by making it illegal to conduct space activities without state approval. This aims at meeting the authorization requirement in Article VI of the Outer Space Treaty discussed above.

It should be noted, however, that the Treaty itself does not stipulate any obligation to introduce any specific type of licensing regime. In fact, the licensing regimes in national space laws vary considerably[127] and may include options from a single license to, more commonly, requiring several licenses for distinct types or phases of space activities, for example, for the launch of a space object; the reentry of a space object; for running a launch facility; and for operating a space object (like a satellite).

Jurisdiction may be based on the location where the object is launched (e.g. state territory or facility), even if it is launched by a foreign national; or notwithstanding the location, if a national of the state launches the object.[128] Thus, sometimes it may be even necessary for space companies to approach several states to obtain the required licenses.

Dempsey lists some other interesting variations in national practice:[129]

- if the launch occurs from a site outside state territory, some countries (France and Australia) have a separate and less onerous authorization process as compared to launches within state territory;
- for reasons of safety and environmental protection, Australia requires a separate license for the terrestrial infrastructure;

126 *Amoco International Finance v Iran* (1987) 15 Iran-US CTR 189, 239.
127 Dempsey (n 4) 42.
128 ibid 15.
129 ibid 42–43.

- in national space legislation as it currently stands in the 26 countries reviewed, still it is only the Australian statute that defines the altitude from which outer space begins and air space ends and from where an object is legally considered to be a 'space object';[130]
- while some national space laws require insurance and indemnification, most countries fail to address these issues;
- some states, like China, explicitly lay down the rule that launch licenses are non-transferable; most other countries do not bother to say anything about it;
- but '[m]ost national space laws require that launch activity should not jeopardize public health, safety or property, should not adversely affect national security, and should not operate in a manner inconsistent [with] the State's international obligations.'[131]

Thus, licenses may address the need for environmental protection.[132] This is important because the Outer Space Treaty seeks to avoid harmful contamination of outer space, the moon and other celestial bodies as well as 'adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter' (Article IX). It calls for 'appropriate measures,' where necessary. Moreover, as mentioned above (although perhaps not an environmental problem *strictu senso*), there is growing international concern about the unresolved problem of space debris.

Licenses can be crucial in the protection of foreign investment against political risk for foreign investment. Many BITs also accept licenses (or permits) as a form of property conferred by law or by contract, thereby constituting a protected investment.[133] The specific definition of licenses will depend on the

130 See supra n 71.

131 Dempsey (n 4) 42.

132 On space-related environmental problems see Viikari (n 83) 717–68.

133 In the *Tecmed* case, for example, a license to operate a landfill was revoked. The ICSID tribunal held that the failure to renew the operating license was an expropriation or equivalent measure, see *Técnicas Medioambientales Tecmed, SA v United Mexican States*, ICSID Case No ARB(AF)/00/2, Award (29 May 2003) para 151. The Tribunal found that the Mexican government's refusal to renew the permit to operate the landfill and the closure of the landfill implied that 'the economic or commercial value directly or indirectly associated with those operations and activities was irremediably destroyed' (para 147).

The *Metalclad* case, in which the claimant was unable to operate a landfill site it had purchased in Mexico because the local authority refused to issue the necessary building license, is the most instructive one in this regard; see August Reinisch, 'Expropriation' in Peter Muchlinski, Frederico Ortino and Christoph Schreuer (eds), *The Oxford Handbook of International Investment Law* (OUP 2008) 455–56.

The European Court of Human Rights, when interpreting the meaning of the term of 'possessions' in Article 1 of the Additional Protocol 1 to the European Convention on

applicable IIA.[134] Often, however, licenses are understood as covering rights to explore, cultivate, extract or exploit natural resources.[135] That may cover satellite remote sensing projects to discover new oil and gas resources on Earth, or space mining projects. Different types of licenses may be required for other types of commercial space activities, such as space tourism.

In conclusion, it may be noted that in principle there is nothing to prevent foreign investors conducting commercial space activities from relying on provisions in IIAs protecting them against an illegal refusal by the host to grant a required license or against unlawful interference by host state authorities with existing licenses.

3.5 *Political Risk Insurance*

As noted in the introduction to this article, political risk is a limited concept addressing specific kinds of risk – different from ordinary commercial risk – that a foreign investor may encounter in the host state arising from governmental interference or negative political developments in the host state. The insurable risks are similar to those addressed in BITs.

Political risk insurance is one method for the foreign investor to protect an investment asset by entering into an insurance contract with a financial institution (the insurer) which – against payment of a premium – agrees to compensate the insured fully or partly for financial loss due to specified events,

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Human Rights (ECHR), recognized that even a license to serve alcoholic beverages is a 'possession' looking at the economic interests involved in running the restaurant at issue because 'the maintenance of the license was one of the principal conditions for the carrying on of the applicant company's business, and that its withdrawal had adverse effects on the goodwill and value of the restaurant ...'; see *Tre Traktörer AB v Sweden*, ECtHR, Ser A No 159 (1989) para 53.

134 The 2012 US Model BIT includes licenses in the definition of 'investment'. But there is a qualification. A note stipulates the following:

> Whether a particular type of license, authorization, permit, or similar instrument (including a concession, to the extent that it has the nature of such an instrument) has the characteristics of an investment depends on such factors as the nature and extent of the rights that the holder has under the law of the Party. Among the licenses, authorizations, permits, and similar instruments that do not have the characteristics of an investment are those that do not create any rights protected under domestic law. For greater certainty, the foregoing is without prejudice to whether any asset associated with the license, authorization, permit, or similar instrument has the characteristics of an investment.

See 2012 US Model BIT (n 114) art 1 ('Definitions') Note 2.

135 OECD Negotiating Group on the Multilateral Agreement on Investment (MAI), Drafting Group No 2 on Selected Topics Concerning Treatment of Investors and Investment (Pre/Post Establishment), Definition of Investor and Investment (Note by the Chairman) DAFFE/MAI/DG2(96)1 (29 February 1996) para 17.

such as expropriation of an asset or damage caused by political violence. The insurance contract thus shifts the risk of financial loss from the foreign investor to the insurance provider.

There are three main types of political risk insurance providers, namely national governmental agencies, treaty-based international organizations, and private companies.[136] The following will briefly discuss the more important first two categories and neglect private sources of political risk insurance for reasons of limited space and lower practical importance.[137]

3.5.1 National Programmes and the Example of OPIC

Almost all major capital-exporting nations have some form of programmes or agencies to offer political risk insurance for outward investment of their nationals, including most member countries of the Organisation for Economic Co-operation and Development (OECD), as well as China, India, and South Africa.[138] Exceptions are Ireland, New Zealand and Mexico. The primary purpose is to support the state's own national economy. Some combine investment protection insurance with export credit insurance. The investment risks covered normally include expropriation, non-convertibility of currency, and losses from political violence.[139] The insured period may extend up to 20 years. Some national programmes, like the German one, are subsidized by the government.

National political risk insurance schemes exhibit many differences in detail, but most require that the host country has concluded an agreement on subrogation with the home state of the investor. Subrogation means that whenever the insurer compensates the investor under the insurance contract, the rights of the investor against the host state are assigned to the insurer.[140]

Countries may conclude specific agreements on this (which is US practice), or may include subrogation clauses in their BITs. The 2008 German Model BIT has a detailed provision on subrogation in Article 6.[141] It stipulates the right of the insurer country to be subrogated to the rights of the insured investor and to seek reimbursement of compensation paid to the investor from the host

136 See Kathryn Gordon, 'Investment Guarantees and Political Risk Insurance: Institutions, Incentives and Development' in OECD, *Investment Policy Perspectives 2008* (OECD 2009) 91.

137 See Salacuse (n 85) 272–3; Dolzer and Schreuer (n 85) 228–31.

138 Salacuse (n 85) 247–48 and fn 10.

139 Dolzer and Schreuer (n 85) 228.

140 See Huawei Sun and Chang Liu, 'Political Risk Insurance' in Barton Legum (ed), *The Investment Treaty Arbitration Review* (3rd edn, Law Business Research Ltd 2018) 216–28.

141 Dolzer and Schreuer (n 85) 230, for the text of Article 6 see ibid 366.

state. As normally international law applies to such agreements and provision is made for state-to-state arbitration in case of dispute, the subrogation provisions have the effect that 'disputes, which began as controversies between investors and host governments subject to national law, are converted into diplomatic disputes, with all the attendant consequences.'[142]

The US Overseas Private Investment Corporation (OPIC), established in 1971, is the oldest and geographically most widely spread programme of political risk insurance. It has its roots in the US Investment Guarantee Program that formed part of the Marshall Plan for the reconstruction of Europe after World War II.[143] OPIC's primary objective is to assist developing countries and countries moving from non-market to market economies.[144] OPIC has standardized insurance contracts, including special ones for certain types of investments like oil and gas exploration and leases.[145] While OPIC does not cover ordinary commercial risk of foreign investment, insurance is available for specified political risk, namely (a) inconvertibility of currency; (b) expropriation of the investment by a foreign government; (c) loss due to war, revolution, insurrection, or civil strife; and (d) loss due to 'business interruption' arising from any of the three aforementioned risks.[146]

OPIC insurance is available only to US investors.[147] This includes not only US citizens and companies, but also a foreign subsidiary if it is wholly owned by an American corporation. If the envisaged host country is eligible for OPIC coverage, the foreign subsidiary is considered as an 'eligible investor' and entitled to directly ask OPIC for insurance coverage. Moreover, even a minority investment interest in a project that is controlled by non-Americans can obtain OPIC insurance if the project meets all other eligibility requirements.

Another important requirement is that the investment itself needs to conform to specified criteria 'relating to the nature of the investment interest to be insured, the type of project in which it is made, and the country in which it is located.'[148]

142 Salacuse (n 85) 249.
143 ibid 249–65.
144 For a detailed discussion of the various objectives and limitations for OPIC's activities see ibid 250–51.
145 ibid 252.
146 ibid 252–58.
147 ibid 258–59.
148 ibid 259.

Salacuse clarifies this further as follows:

> Insurable investments cover a broad range of economic and financial relationships. Under the law, the term 'investment' includes any contribution or commitment of funds, commodities, services, patents, processes, or techniques in the form of:
> (1) a loan or loans to an approved project,
> (2) the purchase of a share of ownership in any such project,
> (3) participation in royalties, earnings or profits of any such project, and
> (4) the furnishing of commodities or services pursuant to a lease or other contract.

Thus, not only may eligible investors insure debt or equity investments, but eligible contractors with construction contracts and eligible suppliers of technology may also obtain insurance coverage.

3.5.2 The Multilateral Investment Guarantee Agency (MIGA)

Among the existing multilateral organizations supporting political risk insurance, MIGA launched by the World Bank in 1985, is the most significant.[149] MIGA was created in the hope that 'the flow of foreign investment to developing countries would be facilitated and further encouraged by alleviating concerns related to non-commercial risks.'[150] The focus is clearly on developing countries, as listed in Schedule A to the Convention. The investment has to be made in the territory of a MIGA member state on that list.

MIGA also has provisions on eligible investors and investments.[151] The investor must be a national of a state party other than the host state. For corporations, there are two alternative tests. The first option requires that the company both is incorporated and has its main place of business in a MIGA country. The second option applies to a corporation if most of its capital stock is owned by nationals (whether individuals or companies) of MIGA countries. State-owned enterprises qualify as well as long as they are operated on a commercial basis. As regards eligible investments, apart from the above mentioned limited list of destination countries, MIGA accepts a rather broad definition

149 See further Stephan W Schill, 'Multilateral Investment Guarantee Agency' in Wolfrum (n 32).

150 Convention Establishing the Multilateral Investment Guarantee Agency (adopted 11 October 1985, entered into fore 12 April 1988) 1508 UNTS 99 (MIGA Convention), Preamble.

151 Salacuse (n 85) 268–69.

of 'eligible investment' under the headings of 'equity interests,' which includes both direct and portfolio investments, and 'non-equity direct investments.'[152]

MIGA offers insurance against four types of non-commercial risk:

(a) monetary transfer and convertibility risks;
(b) expropriation and similar measures;
(c) breach of contract by the host state when the investor has no access to an independent court or tribunal, is confronted with unreasonable procedural delays, or cannot enforce an arbitral award; and
(d) military action or civil disturbance in the territory of the host state.

3.5.3 Coverage of Commercial Space Activities?

When the question of insurance relating to the space industry comes up, the discussion usually focuses on the two major types of space insurance available on the global market.[153] One is first-party property insurance, which is a 'launch and in-orbit' insurance protecting the owner or operator of the satellite against loss of damage during launch or in-orbit operation. The other one is third-party liability insurance, which protects a launching agency or satellite operator/owner against compensation claims for damages caused to third parties by a launcher, satellite or part thereof during the space operation. The latter is connected to the liability regime established by the 1967 Outer Space Treaty, the 1972 Space Liability Convention and regulations in national space legislation, if any.

In fact, however, only some national space statutes 'require insurance and indemnification, while many others are silent on the question.'[154] In their national space statutes, States may require private operators to accept a 'hold-harmless' provision for the benefit of the Treasury before issuing a license.[155] They may also insist on a financial guarantee or proof of adequate space insurance. The amount of insurance required, however, does not necessarily limit liability.[156] Not all state laws require space companies to provide evidence of insurance.[157] Again, the scope and forms of liability of private space companies

152 For details see ibid 269.
153 See Katarzyna Malinowska, *Space Insurance: International Legal Aspects* (Kluwer Law International 2017); Cécile Gaubert, 'Insurance in the Context of Space Activities' in Dunk and Tronchetti (n 22) 910–48.
154 Dempsey (n 4) 42–43.
155 Gaubert (n 153) 914.
156 ibid.
157 See Dempsey (n 4).

differ in national space legislation[158] and may deviate from the model of the Liability Convention.

These and other types[159] of space insurance focus on operational risks. They will be neglected here because they are quite separate from the issues that are covered by 'political risk insurance' in the context of foreign investment. As regards political risk, whether specialized providers such as OPIC, MIGA, or private insurance providers would cover commercial space activities, may depend very much on the specific type of space project for which insurance for political risk is sought, as well as on the objectives and business models of the insurers.

In many respects, similar considerations may apply as in the case of normal terrestrial business operations. However, with respect to damage caused by political violence in the space segment, for example, to a communications satellite or a space station in orbit in the course of a war or other armed conflict, it seems rather unlikely that political risk insurance coverage would be made available easily. This follows from the above limitation of MIGA coverage to military action or civil disturbance occurring 'in the territory' of the host state. It should be noted that the MIGA condition explicitly requires that the military action or civil disturbance takes place '*in the territory* of the host state.' Action taken from outside the territory of the host state against space objects owned and controlled by a foreign investor in that country would not be covered. So far, however, there is no practice, which could provide further guidance on this matter. This notwithstanding, it seems that political risk insurance faces considerable obstacles in respect of space-related ventures.

3.6 *Arbitration*

Finally, this section will discuss how disputes relating to foreign investment and political risk in commercial space activities can be settled in an effective and balanced manner. In view of the international nature of such cases, the focus is usually on international arbitration because the alternatives of diplomatic protection of the foreign investor by its home state, on the one hand, or the settlement of an investment dispute between a foreign investor and the host state by the latter's domestic courts, on the other hand, are of limited use.

Diplomatic protection implies that the home state of the investor espouses the claim of its national against another state and pursues it in its own name.[160] However, whether such espousal in fact occurs depends on the political

158 For an overview see ibid 31 et seq.

159 For example, relating to product liability.

160 See Chittharanjan F Amerasinghe, *Diplomatic Protection* (OUP 2008).

discretion of the home state. It may often unnecessarily politicize the dispute and is generally not considered as an effective method of dispute resolution. The option of relying on the national courts of the host state to settle the case is equally not attractive from the viewpoint of the foreign investor, mainly due to the possible lack of independence and impartiality. There are other difficulties in making use of the domestic courts of the home state or of those of a third country, because the host state is unlikely to agree on such venues and furthermore there are obstacles arising from rules of state immunity.

Thus, the prevailing method in current international practice is to provide investors with direct access to effective international procedures, in particular arbitration leading to a final and binding award that can be enforced internationally.[161] Arbitration by arbitrators selected by the parties and having the required expertise may be complemented by non-binding methods of conciliation or mediation making use of the assistance of third parties to try and reach a settlement. But arbitration remains not only the most frequently used form of settling investor-state disputes, but also the prevailing method of dispute resolution for international business disputes among private commercial actors.

The following will first briefly outline the available investment arbitration mechanisms in international investment law and then compare the arbitration options available to private commercial space investors under current international space law.

3.6.1 Treaty-Based Investor-State Dispute Settlement

Modern BITs and other IIAs usually include provisions on dispute settlement and most of them have two separate provisions. The first one deals with state-to-state arbitration, meaning arbitration between the contracting parties, which are the two states parties to the treaty. This type of BIT dispute settlement is rarely invoked. Very common, on the other hand, is the use of the second type of dispute settlement between foreign investors and the host state, that is investor-state arbitration or investor-state dispute settlement (ISDS).

Originally, ISDS started by drawing upon methods used in commercial dispute settlement between private parties. Rules and mechanisms used primarily in international commercial arbitration are still applied also in the resolution

161 For a critical review see Robert L Howse, 'International Investment Law and Arbitration: A Conceptual Framework' in Hélène Ruiz-Fabri (ed), *International Law and Litigation* (Nomos) (forthcoming). For a brief overview of dispute settlement provisions in BITs and other IIAs see UNCTAD, *Key Terms and Concepts in IIAs: A Glossary, UNCTAD Series on Issues in International Investment Agreements* (United Nations 2014) 43–56.

of investment disputes between a foreign investor and a host state. But ISDS has its own distinct features due to the involvement of a state and the application of public international law.[162]

There are a number of competing institutions and sets of arbitral rules that can be used for ISDS cases.[163] In ad hoc arbitration (arbitration not conducted under the auspices of a particular arbitral institution) the parties may design their own procedural rules to appoint arbitrators, decide on the applicable law, and agree on other important issues. But it is easier to simply refer to a set of standard arbitration rules adopted by an institution, such as the ICSID Arbitration Rules or the frequently employed UNCITRAL Arbitration Rules (designed for ad hoc arbitration).

As far as foreign-invested commercial space enterprises are covered by an IIA, they are in the same position as any other qualified foreign investor under the treaty and may invoke any of the dispute resolution mechanisms provided for in that treaty to settle claims that may be brought against the host state before an international tribunal. There are no special considerations that would need to be discussed with regard to the legal standing of such enterprises to bring a claim under BITs or other IIAs merely in view of the nature of their business relating to outer space.

3.6.2. Arbitration Based on an Investment Agreement (State Contract)

ISDS can also take place on the basis of investment agreements (investor-state contracts).[164] Such agreements will often contain clauses referring to international arbitration under ICSID, the UNCITRAL Rules or, frequently, also to ICC arbitration.[165]

For its own venue, ICSID offers model clauses for inclusion in investment contracts, both for advance consent for future disputes, as well as for existing disputes. The advance consent model clause (compromissory clause) reads as follows:

> The [Government]/[name of constituent subdivision or agency] of name of Contracting State (hereinafter the 'Host State') and name of investor

162 See Karl-Heinz Böckstiegel, 'Commercial and Investment Arbitration: How Different Are They Today? The Lalive Lecture 2012' (2012) 28(4) Arb Int'l 577–590.

163 See, for example, Hans Danielius, 'ICSID, UNCITRAL and SCC as Investment Fora' in Kaj Hobér, Annette Magnusson and Marie Öhrström (eds), *Between East and West: Essays in Honour of Ulf Franke* (Juris Publishing 2010) 107–16. For further in-depth treatment of ISDS mechanisms see the references provided supra n 85.

164 See also supra Section 3.3.

165 Dolzer and Schreuer (n 85) 254.

> (hereinafter the 'Investor') hereby consent to submit to the International Centre for Settlement of Investment Disputes (hereinafter the 'Centre') any dispute arising out of or relating to this agreement for settlement by [conciliation]/[arbitration]/[conciliation followed, if the dispute remains unresolved within time limit of the communication of the report of the Conciliation Commission to the parties, by arbitration] pursuant to the Convention on the Settlement of Investment Disputes between States and Nationals of Other States (hereinafter the 'Convention').[166]

It may be noted that, at least for ICSID purposes, the agreement to arbitrate, which requires consent in writing, does not have to be recorded in a single document.[167]

In practice, the use of contractual investment arbitration clauses laid down in investment agreements has declined with the development of more effective ISDS-clauses set out in BITs and other IIAs. This notwithstanding, contractual clauses remain highly relevant if there is no applicable investment treaty in a given case. In practice, 16.9% of ICSID cases have been submitted based on an investment agreement between an investor and a host state.[168]

3.6.3 Arbitration Based on National Investment Laws

The national legislation of a host state, most frequently in its investment code, may constitute another source offering foreign investors access to ISDS in the form of international arbitration.[169] This has been the practice of many capital-importing countries. ICSID is often listed as one option among others, such as ad hoc arbitration or ICC arbitration. Unlike arbitration clauses laid down in investment treaties, arbitration provisions in national laws do not depend on nationality requirements.[170]

166 International Centre for Settlement of Investment Disputes (ICSID), 'ICSID – Model Clauses' <http://icsidfiles.worldbank.org/icsid/icsid/staticfiles/model-clauses-en/7.htm#a> accessed 24 September 2017.

167 See *Amco v Indonesia*, ICSID Case ARB/81/1, Decision on Jurisdiction (25 September 1983) (1993) 1 ICSID Reports 377, 392 and 400. See also *CSOB v Slovakia*, Decision on Jurisdiction (24 May 1999) (1999) 14 ICSID Review 251, 268–71 (consent to ICSID jurisdiction can be given by an agreement between the parties referring to another legal instrument).

168 ICSID, 'The ICSID Caseload – Statistics (Issue 2016–2)' (2016) <https://icsid.worldbank.org/en/Pages/resources/ICSID-Caseload-Statistics.aspx> accessed 10 June 2018.

169 See Christopher Dugan and others, *Investor-State Arbitration* (OUP 2011) 230–36.

170 Christoph Schreuer, 'Investment Arbitration Based on National Legislation' in Gerhard Hafner and others (eds), *Völkerrecht und die Dynamik der Menschenrechte, Liber Amicorum Wolfram Karl* (facultas.wuv 2012) 527–37.

The legislative provision envisaging arbitration is a mere general offer of consent and needs to be perfected by acceptance of the investor. This can be done, for example, by filing a request for arbitration. The percentage of ICSID cases submitted under an arbitration provision in national investment legislation is only 9.7%.[171]

3.6.4 Arbitration Options Under the Space Law Regime

Finally, the article will now examine any further options available to foreign commercial space companies under international space law to settle disputes concerning political risk cases with a host state. The state-centered approach of the five space treaties has already been discussed at the beginning of this article.[172] Originally, international space law did not conceive private actors to be involved in dispute settlement at all.[173] It was supposed to be limited to states. The main space treaties are generally very weak on dispute settlement, even as regards inter-state disputes.[174] They refer to simple consultation procedures (Article IX of the Outer Space Treaty), not to binding third party dispute resolution, such as arbitration or adjudication.

This notwithstanding, the reference in Article III of the Outer Space Treaty to the UN Charter can be understood as an indirect reference to the dispute settlement methods listed in Article 33(1) of the Charter. But without consent of the parties there can be no arbitration. The same barrier prevents access to the International Court of Justice (ICJ). Only few true space nations have accepted the so-called 'compulsory jurisdiction' of the ICJ (Article 36 ICJ Statute).[175] Finally, the ICJ is only accessible for states.

171 ICSID (n 168).

172 See supra Part 2.

173 See Fausto Pocar, 'An Introduction to the PCA's Optional Rules for Arbitration of Disputes Relating to Outer Space Activities' (2012) 38 J Space L 171, 196.

174 See Arthad Kurlekar, 'Space – The Final Frontier: Analysing Challenges of Dispute Resolution Relating to Outer Space' (2016) 33 J Intl Arb 379–416; G Maureen Williams, 'Dispute Resolution Regarding Space Activities' in Dunk and Tronchetti (n 22) 995–1046; Karl-Heinz Böckstiegel, 'Some Reflections on Dispute Settlement in Air, Space and Telecommunication Law' in Kaj Hobér, Annette Magnusson and Marie Öhrström (eds), *Between East and West: Essays in Honour of Ulf Franke* (Juris Pub 2010) 43–50; Gérardine Goh, *Dispute Settlement in International Space Law* (Brill 2007); Frans G von der Dunk, 'Space for Dispute Settlement Mechanisms – Dispute Resolution Mechanisms for Space? A Few Legal Considerations' *Space and Telecommunications Law Program Faculty Publications Paper 38* (2001) <http://digitalcommons.unl.edu/spacelaw/38> accessed 24 September 2017.

175 Lotta Viikari, 'Towards More Effective Settlement of Disputes in the Space Sector' [2011] Lapland Law Review 226, 228.

At any rate, private foreign investors and disputes of commercial space companies with host states over political risk issues are not covered by any of the space treaties. This includes the 1972 Convention on International Liability for Damage Caused by Space Objects[176] and the space-related rules and procedures of the ITU.[177]

Apart from the space law treaties, there are two other space-related instruments to consider, first a proposal by the International Law Association (ILA) and, second, a set of rules adopted by the Permanent Court of Arbitration (PCA). The ILA has been working for a number of years on a draft convention for the settlement of space law disputes which places private entities as far as possible on equal footing with states.[178] It finally adopted a revised version of the draft in 1998.[179]

In the ILA Draft Convention, private space enterprises are even given direct access to an envisaged International Tribunal for Space Law, an idea which seems to be inspired by the existing International Tribunal for the Law of the Sea. The scope of application of the draft instrument is rather broad covering all activities in or with effects in outer space, whether carried out by states, international organizations, or nationals of state parties.[180]

While the ILA Draft Convention is based on the model of the UN Convention on the Law of the Sea, there are important differences, apart from the different scope of spatial application (i.e. outer space). Arbitration is the preferred default method of dispute settlement. But there are no provisions in the ILA draft transplanting ideas comparable to those of UNCLOS addressing the International Seabed Authority, the Seabed Disputes Chamber, and Special Arbitration.[181]

176 See supra n 27. For a discussion see Caley Albert, 'Liability in International Law and the Ramifications on Commercial Space Launches and Space Tourism' (2014) 36 Loy LA Intl & Comp L J 233–61; Peter Malanczuk, 'Die völkerrechtliche Haftung für Raumfahrtschäden [Liability in International Law for Damage Caused by Space Objects]' in Böckstiegel (n 34) 755–804.

177 See Srivivasan Venkatasubramanian, 'ITU and Its Dispute Settlement Mechanism' in Mahulena Hofmann (ed), *Dispute Settlement in the Area of Satellite Communication* (Nomos 2015) 23–32; Gerry Oberst, 'Dispute Resolution Before the ITU: The Operator's Experience' in Hofmann, ibid, 43–58.

178 Viikari (n 175) 233.

179 ILA, 'Final Draft of the Revised Convention on the Settlement of Disputes related to Space Activities' in Report of the 68th Conference of the ILA, Taipei (Taiwan, Republic of China) (1998) 249–67.

180 See Viikari (n 175) 234.

181 ibid.

However, the ILA Draft Convention did not receive much response. One reason may be that there is not much international enthusiasm for setting up another specialized tribunal like the proposed Space Law Tribunal. This may help to explain why another project emerged at the PCA.

The PCA adopted the Optional Rules for Arbitration of Disputes Relating to Outer Space Activities at the end of 2011.[182] The PCA is not really a court. It is a facility with a list of arbitrators who can be selected by the parties for dispute settlement. It has an International Bureau, headed by a Secretary-General. Parties using the PCA have wide latitude in selecting both arbitrators and applicable arbitration rules; parties can also make use of registry and secretarial services.

The space-related Optional Rules adopted by the PCA offer a voluntary dispute settlement method for all types of space actors which leads to binding results and incorporates all the advantages that are generally associated in practice with arbitration. The PCA Rules build upon the models provided by UNCITRAL and other types of PCA Optional Rules adopted earlier to attract more business.[183] The new PCA Rules can be applied to any type of party by consent (Article 1(1)). Jurisdiction does not require a specific reference of the dispute being related to outer space. Article 1(2) states that consent to arbitrate constitutes a waiver of a right to immunity to jurisdiction. There are a few differences of the PCA Rules as compared to the general UNCITRAL Rules. For example, a list of arbitrators for selection is established; Article 17(8) envisages a special confidentiality mechanism to make use of a 'confidentiality advisor,' a technical expert who can explain confidential technical information to the arbitrators. Another difference to the UNCITRAL rules lies in the details of designating the appointing authority.

182 PCA, 'Optional Rules for Arbitration of Disputes Relating to Outer Space Activities' (effective 6 December 2011) <https://pca-cpa.org/en/documents/pca-conventions-and-rules/> accessed 10 June 2018. See Fabio Tronchetti, 'The PCA Rules for Dispute Settlement in Outer Space: A Significant Step Forward' (2013) 29(3) Space Policy 181–89; Frans G von der Dunk, 'About the New PCA Rules and their Application to Satellite Communication Disputes' in Hofmann (n 177) 93–126.

183 Such as the PCA Optional Rules of Procedure for Arbitrating Disputes Between Two States (1992); the PCA Optional Rules for Arbitrating Disputes Between Two Parties of Which Only One is a State (1993); the PCA Optional Rules for Arbitration Between International Organizations and States (1996); the PCA Optional Rules for Arbitration of Disputes Between International Organizations and Private Parties (1996); and the PCA Optional Rules for Arbitration of Disputes Relating to Natural Resources and/or the Environment (2002). See <https://pca-cpa.org/en/services/arbitration-services/pca-arbitration-rules-2012/> accessed on 24 September 2017, referring to the PCA Arbitration Rules 2012, a consolidation of four prior sets of PCA procedural rules.

It remains to be seen whether parties will opt for the new PCA Optional Rules. So far, there is no practice. But it is another interesting possibility for those parties who wish to make use of the PCA registry and secretarial facilities. The PCA may be of interest for disputes involving a state and a private party, although for investment disputes of this type, there are already other established mechanisms like ICSID.

4 Conclusion

The preceding analysis has considered the interaction of two very different special branches of international law in addressing how commercial space activities are protected against political risk, namely international space law, on the one hand, and international investment law, on the other hand. While the space treaties lay down the fundamental framework for all space activities, they are state-centered and do not in any meaningful sense recognize the relevance of private commercial actors in outer space. The lack of legal certainty and predictability arises from several inadequacies of the space law regime for private space enterprise, including (a) the lack of harmonization of national space regulations; (b) the lack of international regulations on safety and navigation of aerospace vehicles; (c) the lack of an agreed delimitation of air space (subject to territorial sovereignty) and outer space (not subject to national appropriation); (d) the lack of clear property rights for space mining and space resource exploitation on the international level; and (e) the collision risks arising from the increase of space debris in orbit.

The article has further argued that investment protection treaties and their usual standards of treatment can easily be applied to foreign-owned space companies in the territory of a host state. There are two main aspects, however, where special issues may arise from the nature of commercial space activities in terms of investment law. First, space technology is often sensitive from a national security point of view and may lead host states to restrict foreign investment and/or invoke exceptions. Most countries, however, offer investment protection standards only for the post-establishment phase anyway and reserve the right to determine admission of foreign investment.

Second, while normally not affecting the application of most of the standards of treatment laid down in investment protection treaties in general, there may be instances where loss caused to the space asset in outer space may not be fully covered by requirements in BITs that the investment is made in the 'territory' of the host state, especially if the term 'territory' is not defined in a way explicitly extending the geographical (or spatial) scope of application

of the treaty to outer space. It may depend on the nature of the specific type of commercial space activity (e.g. satellite communications, satellite remote sensing, space mining, space tourism, space colonization, etc.), but the issue is also relevant for the availability of political risk insurance. Some solutions to protect the interests of private commercial space actors might therefore be found, depending on the negotiating power of investors, in contractual investment agreements between the foreign investor and the host state. Finally, the usual ISDS proceedings are equally available for enterprises engaged in commercial space activities. The 2011 PCA Rules for Dispute Settlement in Outer Space may add a useful additional dimension to the prevailing ICSID and UNITRAL proceedings that is more space-activity related. But the PCA Rules have not yet been tested in practice.

Political risk mitigation is certainly important for any major foreign investment project. This is of course also true for the international space business. But it is equally true that multinational corporations and other investors sometimes prefer to take a calculated risk and enter a riskier country because of higher profit expectations, strategic market share considerations, or other anticipated advantages that may compensate them for taking a higher risk.

There may also be other motivating factors. Elon Musk's daring plan for a moon base and a manned mission to Mars by 2022[184] is inspiring others engaged in the commercial space business to move forward – and the focus is not on political risk, but on the need to improve the regulatory framework and international cooperation among the various types of space actors. As put by Ryan Hagemann:

> The legal, regulatory, and international challenges ahead are surmountable, but we should not be under any illusion that it will be an easy path ahead. We will need to establish a clear regulatory framework to ensure certainty and accountability in order to grow investment and spur further innovation. National security considerations will be of paramount importance, lest the specter of space-based conflict leaves this burgeoning marketplace grounded. The international implications of near-Earth orbit competition will necessitate greater cooperation between commercial launch providers, space-based service firms, and, perhaps most importantly, nation-states. What is needed now, more than ever, is a serious

184 See Leah Crane, 'Elon Musk's New Plans for a Moon Base and a Mars Mission by 2022' (*New Scientist*, 29 September 2017) <www.newscientist.com/article/2149003-elon-musks-new-plans-for-a-moon-base-and-a-mars-mission-by-2022/> accessed 28 May 2018.

> and committed partnership between governments, nonprofits, and industry players the world over.[185]

This is part and parcel of a broader vision on the future of space commercialization:

> There are still many hurdles to overcome and we must be mindful of them. Yet we shouldn't let that reality temper our optimism, nor lead us to exuberantly embrace the status quo at the cost of welcoming the future. We should be excited about the possibilities of becoming a true multi-planetary, space-faring species. Humanity's future lies amongst the stars. It's up to us to figure out the best path to get there so that all of us may share in the common heritage of mankind. If we can get the rules right, the sky will no longer be the limit.[186]

185 Ryan Hagemann, 'Afterword' in Hampson (n 68) 35.
186 ibid 36.