

Public Investment Law – A Tool to Secure NewSpace Financing?

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Abstract

Currently, the space industry is witnessing a commercialisation wave which, at least in parts, can be considered as disruptive. New technology and market trends associated to this commercialisation wave are circumscribed by the term NewSpace. Along with the NewSpace trend, there is a wave of investment in commercial space activities. Favourable framework conditions supporting commercialisation are key factors for investment decisions and the commercial success of companies along the entire value chain.

Laws and regulations concerning commercial space activities are established in many countries, but they are currently reviewed and amended in the light of technology and market trends. Certain new services and applications are not yet addressed under national laws, or there is no consensus on their treatment at international level. Overall, there are significant uncertainties and/or evolutions regarding the legal framework in which space companies are operating. Companies along the value chain require different types of governmental approvals, including licenses under national space legislation, licenses under national telecommunications or media law, frequency assignments, market access authorizations, or export/import licenses. Delays in authorisation procedures and/or the denial/revocation of governmental approvals may have serious impacts on investments in space ventures.

So far, investment treaties have not been extensively employed by the space industry for ensuring favourable political and legal conditions supporting their activities. However, the wave of commercial space companies and activities around the globe raises questions on the potential future role of public investment law.

1. Introduction

Currently, the space industry is witnessing a commercialisation wave which, at least in parts, can be considered as disruptive. New technologies are now mature, new types of commercial space services are developed, and many new players pursuing new business models are entering the market. These trends are circumscribed by the term NewSpace.

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Some NewSpace companies are implementing approaches of the information and communications technology (ICT) sector, such as software-based systems and data-driven services. Other companies make increasing use of products from other industry sectors as well as of additive manufacturing (often also referred to as 3-D Printing). This allows faster production of satellites, launchers and their components in higher quantities. Some companies are pursuing new types of applications such as on-orbit servicing of satellites, space tourism, or space mining. In satellite communications, high-throughput communications satellites enable broadband services, and new satellite constellations in low earth orbit (LEO) aim at providing global internet solutions. In Earth observation (EO), cloud computing¹ enables archiving of large data sets and online workflows for data search, analytics² and value adding. This goes along with a change of business models from bespoke services to automated online services. In the launch sector, launchers with reusable components are introduced, thereby potentially reducing costs and increasing launch rates. Due to the growing demand for small satellite³ launches, so-called micro launchers are developed.

During recent years, numerous new players have entered the space markets, including large established actors from the information technology (IT) industry, such as Google or Amazon, but also start-up companies. Often, the business model of such companies focusses on services for commercial or even individual users rather than for the traditional public customers in the space-related market, such as ministries of defence, space agencies, or science organisations.

National space policies are currently reviewed and updated to support further commercialisation. In Germany, the Federal Ministry for Economic Affairs and Energy has commissioned a study in order to understand the driving forces behind the NewSpace ecosystem and related chances and challenges for Germany and Europe.⁴ Similar studies were undertaken in France, Australia and other countries.⁵

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- 1 Cloud computing technologies are, for example, more and more used for the online processing of Earth observation data where users may process large amounts of Earth observation data in the cloud rather than storing each and every dataset on its own devices.
 - 2 On the use of big data analytics in the Earth observation sector, see Anusuya Datta, 'In a Data-Agnostic World, EO Industry Moves Towards Analytics as a Service' (*Geospatial World*, 18 December 2017) <www.geospatialworld.net/blogs/data-agnostic-world-eo-industry-moves-towards-analytics-service/> accessed 24 September 2018.
 - 3 According to NASA, Small spacecraft (SmallSats) focus on spacecraft with a mass less than 180 kilograms. See <www.nasa.gov/content/what-are-smallsats-and-cubesats> accessed 24 September 2018.
 - 4 Bundesministerium für Wirtschaft und Energie (BMWi), *NewSpace – Geschäftsmodelle an der Schnittstelle von Raumfahrt und digitaler Wirtschaft* (2016) <www.bmwi.de/Redaktion/DE/Publikationen/Studien/bmwi-new-space-

Along the NewSpace trend, private investments in space companies are growing significantly. According to recent market reports, cumulative investment in start-up space ventures since 2000 totals USD 18.4 billion, whereby 180 angel- and venture-backed space companies have been founded.⁶

The wave of commercial space companies and activities around the globe raises questions on the potential future role of international investment law. So far, there are only few cases known under international investment law related to investments in space activities.⁷ However, this may change in the coming years.

2. Regulatory Issues for Investments in NewSpace Ventures and Related (Political) Risks

Regulatory issues might be qualified as a risk for foreign investment in NewSpace ventures, considering that they may have a significant impact on investments in commercial space activities along the entire value chain.

2.1 Manufacturing

Manufacturing of space products is at the beginning of the value chain. Global revenues of the satellite manufacturing industry in 2017 are estimated at USD 15.5 billion.⁸ Due to the growing number of satellites launched in 2017 revenues increased by 10%.

Technology trends in this area include, amongst others, additive manufacturing, serial production techniques especially for large satellite constellations, miniaturization of components, increased use of commercial off-the-shelf (COTS) products, including from non-space industries, increased

geschaefstmodelle-an-der-schnittstelle-von-raumfahrt-und-digitaler-wirtschaft.html> accessed 24 September 2018.

- 5 For Australia, see Expert Reference Group (ERG) for the Review of Australia's Space Industry Capability, *Australian Government, Review of Australia's Space Industry Capability* (2017) <<https://industry.gov.au/industry/IndustrySectors/space/Documents/Review-of-Australias-Space-Industry-Capability-Issues-Paper.pdf>> accessed 24 September 2018; for France, see Centre National D'Etudes Spatiales (CNES), *Challenge, Inventing The Future Of Space* (2017) CNES MAG n°72.
- 6 Bryce, *Start-Up Space Update on Investment in Commercial Space Ventures* (2018) <https://brycetek.com/downloads/Bryce_Start_Up_Space_2018.pdf> accessed 24 September 2018.
- 7 One of the rare cases known concerns pending claims of a French investor in Mexico for fair and equitable treatment in terms of satellite regulation. See *Eutelsat v. Mexico Eutelsat SA v United Mexican States*, ICSID Case No ARB(AF)/17/2 (date registered: 16 August 2017).
- 8 Satellite Industry Association, *State of the Satellite Industry Report 2018* (2018) <<https://www.sia.org/wp-content/uploads/2018/06/2018-SSIR-2-Pager-.pdf>> accessed 24 September 2018.

focus on software instead of hardware, and the use of electric propulsion. Many of the new satellite operator companies rely on small satellites.

Space technology is dual use, which means that it can be used for civil as well as for military purposes. Therefore, the sale of space products is subject to laws and regulations focussing on national security, such as foreign trade legislation and export control laws. As a general trend, the commercialisation wave in the space manufacturing industry leads to reviews and softening of regulatory restrictions on the export of dual use space technology, to allow NewSpace companies to reach international markets. In January 2017, the United States has removed several space items from the US Munitions List (USML), which defines items subject to the strict US International Traffic in Arms Regulations (ITAR).⁹ For investments in the manufacturing sector, authorisation procedures under export control laws are however still a significant risk.

New trends and technologies in manufacturing further raise issues with regard to standardisation, certification and validation requirements for space products.¹⁰ Established rules and procedures, such as the standards of the European Cooperation for Space Standardization (ECSS), put a heavy burden on manufacturers in terms of costs and efforts and, consequently, claims for review and relaxation are increasingly voiced. On the other hand, a lack of clear safety standards for new technologies can also be a risk. In the United States, the Defense Advanced Research Projects Agency (DARPA) Consortium for Execution of Rendezvous and Servicing Operations (CONFERS) aims to develop ‘Rules of the Road’ for on-orbit servicing of satellites. Members of the consortium brought forward that ‘the lack of clear, widely accepted technical and safety standards for responsible performance of on-orbit activities involving commercial satellites remains a major obstacle to further expansion of commercial and government space operations, and could put long-term sustainability at risk.’¹¹

During the last years, export credits by public banks, such as the French Coface/Bpifrance,¹² or the Export-Import Bank of the United States (EXIM), were increasingly used to back international sales of satellites and other space

9 Jeff Fourst, ‘Federal Government Tweaks Space Export Control Rules’ (*SpaceNews*, 12 January 2017) <<http://spacenews.com/federal-government-tweaks-space-export-control-rules/>> accessed 24 September 2018.

10 For more information on standardisation, certification and validation requirements, see John Pelton and Ram Jakhu (eds), *Space Safety Regulations and Standards* (Elsevier 2010).

11 DARPA, *CONFERS to Establish “Rules of the Road” for On-Orbit Servicing of Satellites* (2017) <www.darpa.mil/news-events/2017-10-04> accessed 24 September 2018.

12 In January 2017, Coface has ceded its State export guarantees activity to the French public investment bank, Bpifrance.

products.¹³ Other countries, such as Canada, the United Kingdom, or Russia are following. The availability of public export credits supports the competitiveness of national industry and their success in export markets. Conversely, political decisions on export guarantees and/or changes of the policies of national export credit agencies are a risk associated with investments in the space manufacturing industry.

These regulatory issues are well known in the space sector, but new approaches might be required in the light of the growing commercialisation and the use of new technologies. Export control laws may require adaptations, as some of the NewSpace products may not raise the same security concerns as traditional space products. Standardisation rules may require relaxation and/or need to be developed for new types of technologies. Export credits may become more important as the global markets develop, however they may also imply trade and competition issues.

2.2 Launch

The global revenues of the commercial launch sector, according to recent market reports, are USD 4.6 billion, showing a decrease by about 16% in comparison to 2016.¹⁴ Even though the number of launches was consistent with 2016, more launches used less expensive launch vehicle types.

As of today, there is still a very limited number of commercial launch service providers. However, new ventures for large satellite constellations need launch services at lower costs and at more frequent intervals. This leads to new players and new offers. SpaceX has, for the first time, introduced reusable launch vehicles and offers higher launch rates than its established competitors. For small satellite launches, more than 30 micro launchers are currently under development. New sub-orbital launch vehicles are developed for space tourism and for sub-orbital experiments, e.g. by Virgin Galactic and Blue Origin.

The scope and content of national space laws on the licensing of these commercial launch services differs from one jurisdiction to another. Some countries have recently adapted existing national space laws and/or introduced new legislation to foster the competitiveness of their launch service providers. In 2018, the United Kingdom has adopted its Space Industry Act¹⁵ ‘to stimulate the market for space activities (primarily small satellite launches) and sub-orbital spaceflight activities in the United

13 OECD, *Space and Innovation* (OECD Publishing 2016) 74 et seq.

14 Satellite Industry Association, *State of the Satellite Industry Report 2018* (2018) <<https://www.sia.org/wp-content/uploads/2018/06/2018-SSIR-2-Pager-.pdf>> accessed 24 September 2018.

15 Space Industry Act 2018 (Royal Assent 15 March 2018) <www.legislation.gov.uk/ukpga/2018/5/contents/enacted/data.htm> accessed 24 September 2018.

Kingdom.¹⁶ In 2016, the United States has extended the so-called learning period for sub-orbital spaceflights until 2023, which prevents the US Federal Aviation Administration (FAA) from imposing stringent safety regulations that could potentially hamper the growing industry, in order to give its industry more time to build up flight experience before new regulations are enacted.¹⁷

Together with the development of new launchers, such as reusable launch vehicles, micro launchers or sub-orbital flights, new issues and risks arise. For the re-use of rockets, the question arises as to whether there is a need to adapt licensing procedures for rockets which are re-used. Micro launchers are planned in jurisdictions that have not had a licensing procedure in place. For sub-orbital vehicles, in many jurisdictions, it is not yet clear as to whether these flights require a license under space law, under air law and/or under a special licensing procedure.

2.3 Satellite Services

Satellite services cover a broad variety of services, such as telecommunications, broadcasting, internet, meteorology, Earth observation data, or position, navigation and timing signals and related services. The global satellite services revenues in 2017 are estimated at USD 128.7 billion.¹⁸ In this sector, numerous new systems are under construction or announced for the future, often for large constellations of small satellites. Several mergers and acquisitions among new and established players already occurred in the last two years.¹⁹ Significant future growth of the sector is anticipated, especially from online services using data analytics.²⁰ Several companies are developing new types of satellite services and applications,

16 Space Industry Act 2018 – Explanatory Notes (Royal Assent 15 March 2018) <www.legislation.gov.uk/ukpga/2018/5/notes/division/1/index.htm> accessed 24 September 2018.

17 US Commercial Space Launch Competitiveness Act, Public Law No 114-90 (introduced 12 May 2015, entered into force 25 November 2015) <www.congress.gov/bill/114th-congress/house-bill/2262/text> accessed 24 September 2018.

18 Satellite Industry Association, *State of the Satellite Industry Report 2018* (2018) <<https://www.sia.org/wp-content/uploads/2018/06/2018-SSIR-2-Pager-.pdf>> accessed 24 September 2018.

19 See e.g. Planet, *Planet Labs to Acquire RapidEye* Press Release (15 July 2015) <www.planet.com/pulse/blackbridge/> accessed 24 September 2018; UrtheCast, *UrtheCast to Acquire Deimos Satellites and Earth Imaging Operations* <<https://blog.urthecast.com/updates/urthecast-to-acquire-deimos-satellites-and-earth-imaging-operations/>> accessed 24 September 2018.

20 According to a stakeholder consultation undertaken by the European Association of Remote Sensing Companies (EARSC), the market share of EO online services is estimated to grow rapidly, from less than 5% today of the overall EO services market to around 25% in 5 years; see EARSC, *Study to Establish a Marketplace Alliance for EO Services (MAEOS) – Stakeholder Views Analysis* (2016) <<http://ears.org/news/study-to-establish-a-marketplace-alliance-for-EO-services-maeos>> accessed 24 September 2018.

such as on-orbit servicing, global internet connectivity, in-flight connectivity, space tourism, or even space mining.

Regulatory issues in relation to satellite services primarily concern licensing under national space law, licensing under national telecommunications and media laws, and frequency assignments for space and ground systems. Along with the NewSpace trend, many satellite services become part of the larger digital economy. New legal issues therefore arise under IT law concerning, for example, e-commerce laws and laws and regulations on data security or personal data protection.²¹

The scope and content of licensing regimes for satellite services under national space legislation differ from one jurisdiction to another. Several States have recently adapted their national space laws and/or adopted new laws, in particular in response to small satellite projects and new types of applications, such as asteroid mining and on-orbit servicing. Austria,²² Denmark,²³ and Finland²⁴ have adopted licensing procedures in response to small satellite projects in these countries, whilst Belgium²⁵ and the Netherlands²⁶ have adapted existing regulations to cover small satellite projects. Some states, such as the United States²⁷ and Luxembourg²⁸ have

21 For an overview of relevant IT law issues, see Ingo Baumann and Erik Pellander, 'New Legal Issues in Earth Observation Data and Services' in Mahulena Hofmann (ed), *Innovation in Outer Space: Legal and Regulatory Aspects* (Nomos 2018).

22 Austrian Federal Law on the Authorisation of Space Activities and the Establishment of a National Space Registry (adopted by the National Council 6 December 2011, entered into force 28 December 2011) <www.unoosa.org/documents/pdf/spacelaw/national/austria/austrian-outer-space-actE.pdf> accessed 24 September 2018.

23 Danish Outer Space Act, Act no. 409 (adopted 11 May 2016, entered into force 1 July 2016) <<https://ufm.dk/en/legislation/prevaling-laws-and-regulations/outer-space/outer-space-act.pdf>> accessed 24 September 2018.

24 Finnish Act on Space Activities, 63/2018 (adopted 12 January 2018, entered into force 23 January 2018) <<https://tem.fi/documents/1410877/3227301/Act+on+Space+Activities/a3f9c6c9-18fd-4504-8ea9-bff1986fff28/Act+on+Space+Activities.pdf>> accessed 24 September 2018.

25 Law of 17 September 2005 on the Activities of Launching, Flight Operation or Guidance of Space Objects, consolidated text as revised by the Law of 1 December 2013, BOJ (15 January 2014) (adopted 17 September 2005, revised 1 December 2013, entry into force of revised text 15 January 2014) <www.belspo.be/belspo/space/doc/beLaw/Loi_en.pdf> accessed 24 September 2018.

26 Decree Expanding the Scope of the Space Activities Act to Include the Control of Unguided Satellites (adopted 19 January 2015, entered into force 1 July 2015) <www.unoosa.org/documents/pdf/spacelaw/national/Netherlands_BZ116174A.pdf> accessed 24 May 2018.

27 US Commercial Space Launch Competitiveness Act, Public Law No 114-90 (introduced 12 May 2015, entered into force 25 November 2015) <<https://www.congress.gov/bill/114th-congress/house-bill/2262/text>> accessed 24 September 2018.

28 Projet de loi sur l'exploration et l'utilisation des ressources de l'espace (adopted 13 July 2017, entered into force 01 August 2017) < <http://www.luxembourg.public.lu/>

adopted proactive national space legislation on property rights in space resources to foster new satellite services in the area of space mining, though there is no consensus on this topic at international level. Furthermore, the United States, is currently developing new regulations to cover new types of space services, such as on-orbit servicing, in order to provide a clear and predictable legal framework for the industry.²⁹

Under national telecommunications law, frequency assignments are required for space and ground stations.³⁰ While many States now have general licenses for satellite services and standard ground equipment, other countries still require individual licenses. Furthermore, national laws regulate under which conditions commercial operators may request the national authority to initiate procedures for the filing of frequencies and orbital slots at the International Telecommunication Union (ITU) for protecting the use of such frequencies and orbital slots by satellite systems. Due to the high number of planned satellites, including large constellations, coordination of new systems under the ITU procedures becomes increasingly difficult.³¹ Traditionally, the State providing licenses and frequency assignments under telecommunications law was identical with the State providing licenses under national space law. Increasingly, however, operators use foreign authorities for filings under the ITU procedures, partly due to the length and costs of the procedure in their home country. Thereby it may become more likely that NewSpace companies will be subject to foreign authorities for the assignment of appropriate frequencies for the implementation of their projects.

In some jurisdictions, specific authorization under national telecommunication law may be required to receive market access for the provision of satellite services. The NewSpace company OneWeb, for example, is licensed by the United Kingdom. To provide services in the United States, OneWeb requires authorization from the Federal Communications Commission (FCC). In June 2017, the FCC approved OneWeb's request, and it is currently reviewing a large number of requests by other new operators.³² Authorizations on market access for the provision of

[fr/actualites/2016/11/11-space-resources/projet-de-loi-espace.pdf](http://actualites/2016/11/11-space-resources/projet-de-loi-espace.pdf) accessed 24 September 2018.

29 American Space Commerce Free Enterprise Act, HR 2809. For the status of the act, see <www.congress.gov/bill/115th-congress/house-bill/2809> accessed 24 September 2018.

30 For an overview of the legal issues associated with ground stations, see Ingo Baumann, *Das Internationale Recht der Satellitenkommunikation* (Peter Lang 2004).

31 Peter B de Selding, 'Signs of a Satellite Internet Gold Rush in Burst of ITU Filings' (*SpaceNews*, 23 January 2015) <<http://spacenews.com/signs-of-satellite-internet-gold-rush/>> accessed 24 May 2018.

32 FCC, OneWeb Market Access Grant, FCC 17-77 (adopted 22 June 2017, released 23 June 2017) <www.fcc.gov/document/oneweb-market-access-grant> accessed 24 September 2018.

telecommunication services are, accordingly, another area where NewSpace companies are faced with foreign authorities.

2.4 Ground Equipment

Ground equipment is required for the operation of a satellite systems, as well as for the use of satellite services. Ground stations for the operations of space systems includes control centres, in-orbit testing (IOT) stations, tracking, telemetry & command (TT&C) stations, gateway stations as well as other types of ground stations. User ground equipment includes satellite TV dishes, very small aperture terminals (VSATs), satellite phones and other satellite terminals, including GPS chips in smartphones. In 2017, satellite ground equipment revenues increased by 5.6% in comparison to 2016 to reach USD 119.8 billion.³³

Regulatory issues for ground equipment vary depending on the type of application in question. As already stated above, many countries today have general licenses for satellite ground equipment, while others still require individual licenses. Some authoritarian regimes are highly restrictive in allowing the use of satellite TV dishes or satellite phones by their citizens. Licenses for the provision of in-flight connectivity are currently subject to a litigation before the General Court of the European Union.³⁴ For Galileo receivers, the European Commission has requested the United States to waive licensing requirements under US telecommunication law on the use of Galileo receivers in the United States.³⁵

3. Applying International Investment Law to NewSpace Ventures?

The growing investments in NewSpace ventures together with the related regulatory issues raise the question whether and to what extent investment treaties can be applied to mitigate risks in relation to NewSpace investments.

3.1 Criteria for Application of Investment Treaties

International investment law aims for an appropriate balance between the protection of public interests and the creation of a favourable investment climate. Many countries grant guarantees to investors in order to attract foreign investments. These are mostly laid down in bilateral, at times also multilateral investment treaties. Applying these treaties to investments in NewSpace ventures generally requires an ‘investment’ by investors of one

33 Satellite Industry Association, *State of the Satellite Industry Report 2018* (2018) <<https://www.sia.org/wp-content/uploads/2018/06/2018-SSIR-2-Page-.pdf>> accessed 24 September 2018.

34 CJEU, Case T-245/17, *ViaSat v Commission* (claim brought on 24 April 2017).

35 For an overview over the procedure, see ‘Use of Foreign Satellite Navigation Signals’ <www.gps.gov/spectrum/foreign/> accessed 24 September 2018.

Contracting State in the territory of another Contracting State. The latter State is also referred to as the ‘host State’.

Regarding the definition of the term ‘investment’, there are two approaches used in investment treaties to define the material scope of the treaty: 1) the asset-based approach and 2) the enterprise-based approach.³⁶ Most definitions of investments found in international investment treaties are asset-based. These treaties refer to ‘every kind of asset’ and provide examples of which types of assets are covered, such as property, shares of companies, claims to money, intellectual property rights (IPRs), trade-names, trade and business secrets, technical processes, know-how, licenses or business concessions under public law, etc.³⁷ The list of examples provided in investment treaties is often illustrative and non-exclusive. According to the enterprise-based approach, by contrast, investments are limited to businesses or shares in businesses. Rather than safeguarding foreigners’ property and rights, the enterprise-based approach looks to the foreigner’s ownership and control. According to both, the (broader) asset-based definition of the term ‘investment’, as well as according to the enterprise-based approach, there are several scenarios for investments in NewSpace ventures that may fall under the scope of investment treaties. However, the level of protection may differ. Under the asset-based approach a variety of tangible and intangible assets may qualify as an investment, whilst under the enterprise-based approach it is required that the NewSpace venture as a whole is affected by the action of foreign governments.

On the recognition of key assets for the implementation of space projects, i.e. administrative rights, such as the license under national space law to launch or operate a satellite as well as frequency assignments under national telecommunication law, treaty practice differs significantly.³⁸ In case administrative rights are independently recognised as an ‘investment’ under an investment treaty, the denial and/or revocation of administrative rights required for the implementation of NewSpace ventures might be subject to a claim under this treaty. Even if these rights are not explicitly covered by the investment treaty in question, the denial and/or revocation of such rights might be subject to a claim under this treaty, to the extent that that it affects other assets which are under the scope of the treaty and/or affects the NewSpace venture as a whole.

36 Krista Nadakavukaren Schefer, *International Investment Law – Text Cases and Materials* (2nd edn, Edward Elgar 2016) 70 et seq.

37 See 2008 German Model BIT art 1(1) <<http://investmentpolicyhub.unctad.org/Download/TreatyFile/2865>> accessed 24 September 2018; see also Nadakavukaren Schefer (n 36) 70 et seq.; Muthucumaraswamy Sornarajah, *The International Law on Foreign Investment* (3rd edn. CUP 2010) 191.

38 Muthucumaraswamy Sornarajah, *The International Law on Foreign Investment* (3rd edn. CUP 2010) 192.

International investment law is restricted to foreign investments and excludes purely domestic disputes.³⁹ Accordingly, a nexus between the investment made by the investor from one Contracting State and the territory of the other Contracting State (the host State) is required in order for investment treaties to apply. For investments in assets which are beyond the limits of national jurisdiction, such as a satellite orbiting in outer space, application of treaty provisions and identification of a host State may raise particular difficulties.

3.2 Manufacturing

According to the broad definition of the term investment in many investment treaties, there are several potential scenarios relevant for investments in space manufacturing. These include investments in physical assets, e.g. setting up of production facilities. Non-tangible assets may concern IPRs or technical processes used and/or acquired during manufacturing, or the acquisition of shares in a foreign manufacturer. Administrative rights, which are of particular importance for the manufacturing sector, concern export or import licenses for the sale of goods abroad, as well as export guarantees for transboundary deals.

Investments in the manufacturing industry can sometimes be clearly allocated to the territory of a host State, e.g. in case of a production facility set-up in such host-State. However, other cases are not as obvious. For example, in case of a so called in-orbit delivery of a satellite, ownership is transferred to the customer when the satellite is already beyond the limits of national jurisdiction. There are several factors that could be taken into consideration when determining the host State for such an investment. One could tie host State status to the registration of the satellite under international space law (for more detail see Section 3.4 below), to the jurisdiction under which the satellite is controlled, or to the nationality of the company selling the satellite in orbit. So far, there is no State practice on how to determine host State status for an investment in case of in-orbit delivery.

As regards the risks for investments in the manufacturing sector elaborated above, investment treaties may come into play for the denial of an export or import license, to the extent that an investor is faced with foreign authorities. Standardisation, certification and validation may become of concern too, for example, in case of market access restrictions through arbitrary certification procedures. Disputes in relation to export guarantees are regularly domestic disputes which are not under the scope of international investment law, as these guarantees are granted by the competent authorities of a State to its own nationals.

39 Krista Nadakavukaren Schefer, *International Investment Law – Text Cases and Materials* (2nd edn, Edward Elgar 2016) 112 et seq.

3.3 Launch

Potential investment scenarios within the launch industry may include investments in a variety of tangible and intangible assets, such as investments in launch facilities, procurement of launch services, procurement of hardware, or investments in shares of a foreign launch service provider. Other assets that might fall under an investment treaty are governmental approvals under national space legislation to operate a launch facility and/or to undertake launches. The denial, delay or revocation of these administrative rights might have serious impacts on an investment.

Launch services take place on Earth, in air-space, and in outer space. As long as the physical asset in question is on the territory and/or in national air-space, it can be clearly allocated to the territory of a host State. During the launch, the launcher however goes beyond the limits of national jurisdiction and at least parts of the launcher (i.e. the upper stage) may remain in outer space. Nevertheless, as discussed in more detail below, the registration of a space object in a national registry may, in accordance with international space law, establish a territorial nexus for the determination of the host State in relation to an investment. Other factors could also be taken into consideration for determining which State is the host State, e.g., which State exercises control through issuing licenses, on which territory the launch takes place, or where the control centre for the launch is located. In the end, it will have to be determined on a case-by-case basis which State constitutes the host State for purposes of applying investment treaties.

Due to national security restrictions and political factors, there are not yet many international investments in launch facilities. Launch service providers did so far refrain from moving their facilities abroad. This may change with the advent of NewSpace companies. Foreign investment can namely be anticipated for small satellite launch facilities.

Potential risks that might be mitigated through the application of investment treaties will primarily concern issues in relation to the authorisation and supervision of launch activities. However, level of protection in relation to these administrative rights may differ from one investment treaty to another. Some treaties independently recognise administrative rights, such as a launch license under national space legislation, as an 'investment', whilst under other investment treaties administrative rights are not explicitly covered. For the latter, protection would be limited to governmental actions in relation to the authorization and supervision of launch activities which affect other assets under the scope of the investment treaty in question or the NewSpace venture as a whole.

3.4 Satellite Services

In the satellite services sector, investments in physical assets concern the satellite system used for service provision. Investments in shares of companies and other kinds of interest in companies are other potential assets that may

fall under the scope of investment treaties. Licenses under national space legislation, frequency assignments, and the assignment of orbital slots, or specific authorisations on market access, are administrative rights that may come into play. As stated above, the level of protection in relation to administrative rights, such as licenses under national space legislation, may differ, dependent on the scope of the investment treaty in question.

For satellites orbiting in outer space, the question arises how to define a host State for potential investments. The international legal framework governing the exploration and use of outer space, namely Article II of the Outer Space Treaty, clarifies that '[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.'

Even though a State may not claim sovereignty in outer space, it may exercise jurisdiction over satellites (objects) in outer space that are registered in its national registry for space objects. In this regard, Article VIII of the Outer Space Treaty provides that 'a State on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such objects, and over any personnel thereof, while in outer space or on celestial bodies.'

Through registration of a satellite in its national registry, the State of registry exercises quasi-territorial jurisdiction.⁴⁰ The registration of a space object may therefore establish a territorial nexus for the determination of the host State of an investment. This approach is supported by the UNIDROIT Space Assets Protocol⁴¹ to the Cape Town Convention.⁴² During the negotiations of the Protocol, the drafting parties agreed that, for the definition of 'internal transaction'⁴³ in terms of the Cape Town Convention, a space asset was deemed to be located in the territory of the State of registry.⁴⁴

There are, however, two scenarios where reference to the State of registry does not seem appropriate. Sometimes, the State that is actually exercising

40 Bernhard Schmidt-Tedd and Stephan Mick, 'Art. VIII Outer Space Treaty' in Hobe, Schmidt-Tedd and Schrogl in Stephan Hobe, 'Art. 1 Outer Space Treaty' in Stephan Hobe, Bernhard Schmidt-Tedd and Kai-Uwe Schrogl (eds), *Cologne Commentary on Space Law* (Carl Heymanns 2009) vol 1, 157.

41 Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Space Assets (adopted 9 March 2012) (UNIDROIT Space Assets Protocol) <www.unidroit.org/status-2012-space> accessed 24 September 2018.

42 Convention on International Interests in Mobile Equipment (adopted 16 March 2001, entered into force 1 April 2004) 2307 UNTS 285 (Cape Town Convention).

43 See Cape Town Convention, *ibid*, art 1(n) (defining "'internal transaction'" means a transaction of a type listed in Article 2(2)(a) to (c) where the centre of the main interests of all parties to such transaction is situated, and the relevant object located (as specified in the Protocol), in the same Contracting State at the time of the conclusion of the contract and where the interest created by the transaction has been registered in a national registry in that Contracting State which has made a declaration under Article 50(1)').

44 UNIDROIT Space Assets Protocol art I(3).

control over a space object, e.g. through granting a license under national space legislation, and the State of registry may differ. This arises, inter alia, in case of in-orbit transfer of ownership of a satellite, for example, when the satellite is sold to another operator.⁴⁵ Furthermore, it needs to be considered that many space objects are not registered. In these cases, it seems more appropriate to refer to the State that is exercising actual control through issuing a license for the operation of the satellite under national space law.⁴⁶ Considering the difficulties in determining a host State when a satellite is orbiting in outer space, it should be assessed on a case-by-case basis whether the location of the satellite is decisive or whether there are any other factors that may establish a territorial nexus to a host State, such as the jurisdiction where services are provided, the jurisdiction where a license is granted, or the jurisdiction where the ground control is established.

As regards the acquisition of shares of foreign satellite operators, in August 2017, the French company Eutelsat presented a claim against Mexico at the International Centre for Settlement of Investment Disputes (ICSID) under the 1998 bilateral investment treaty between Mexico and France.⁴⁷ According to publicly available information, Eutelsat argues the Mexican government did not grant it 'fair and equitable treatment' as guaranteed under Article 4 of the 1998 treaty.⁴⁸ Due to Eutelsat's acquisition of Satélites Mexicanos, S.A. de C.V. (Satmex) in January 2014, Eutelsat is considered a Mexican company under Mexican telecommunication law and as such had to reserve 363 MHz of its capacity (which amounts to 7% of Eutelsat's capacity) for national security and social services to the Mexican government free of charge.⁴⁹ The reserved capacity rule does not apply to foreign companies and the Mexican government continues to buy capacity from other operators in addition to its legally reserved capacity. Therefore, Eutelsat requested the Mexican government to update and modify its current telecommunication laws to

45 Bernhard Schmidt-Tedd and Stephan Mick, 'Art. VIII Outer Space Treaty' in Hobe, Schmidt-Tedd and Schrogl in Stephan Hobe, 'Art. 1 Outer Space Treaty' in Stephan Hobe, Bernhard Schmidt-Tedd and Kai-Uwe Schrogl (eds), *Cologne Commentary on Space Law* (Carl Heymanns 2009) vol 1, 155.

46 That is the State that bears international responsibility for the activity under Article VI of the Outer Space Treaty.

47 *Eutelsat v Mexico* (n 7), invoking the Agreement Between the Government of the Republic of France and the Government of the United Mexican States on the Reciprocal Promotion and Protection of Investments (adopted 12 November 1998, entered into force 12 October 2000) <<http://investmentpolicyhub.unctad.org/Download/TreatyFile/1253>> accessed 24 September 2018.

48 Chris Forrester, 'Eutelsat Files Arbitration Claim Against Mexico' (*Advanced Television*, 4 September 2017) <<http://advanced-television.com/2017/09/04/eutelsat-files-arbitration-claim-against-mexico/>> accessed 24 September 2018.

49 *ibid*; see also Eutelsat, 'Eutelsat Communications Concludes Acquisition of SATMEX' Press Release (2 January 2014) <www.eutelsat.com/en/news/2014/Eutelsat-Satmex.html> accessed 24 September 2018.

ensure fair and equal treatment in comparison to its competitors who are not subject to the reserved capacity rule. Irrespective of the merits of this case, it serves as evidence of the potential role and use of investment treaties in space-related issues.

3.5 Ground Equipment

In the ground equipment sector, physical assets subject to an investment treaty may include the ground equipment itself, as well as related production and distribution facilities, whilst intangible assets may include IPRs, trade names, as well as shares. Administrative rights which might be subject to an investment treaty, if covered, are frequency assignments for the provision of services, type approvals, as well as export or import licenses.

Ground equipment that is produced, sold, and used on Earth can be clearly allocated to the territory of a host State. For in-flight connectivity equipment on board of an aircraft, which during the flight may be beyond the limits of national jurisdiction in international airspace, the registration of an aircraft may establish a territorial nexus to a host State.⁵⁰

Consumer ground equipment, such as satellite TV dishes or GPS receivers, are produced and distributed worldwide. New satellite systems aiming to provide global internet and other broadband services to consumers require global distribution and use of the related ground equipment. Thus, transboundary investments can be anticipated. Potential claims in the consumer ground equipment sector under investment treaties might be concerned with questions of market access, if covered by the treaty in question, or relate to breaches of national or fair and equitable treatment clauses.

Operations of certain satellite systems require larger networks of ground stations around the globe. For example, the European Galileo satellite navigation system has more than 30 different ground stations, including in extreme northern and southern regions. For planned and future commercial systems, international investments in ground stations can be anticipated. Some NewSpace companies are already facing regulatory issues in this respect.⁵¹

4. Conclusions

Along with the NewSpace trend, there is a wave of investment in commercial space activities. Favourable legal framework conditions supporting commercialisation are key factors for investment decisions and the commercial success of companies along the entire value chain. So far,

50 Under international air law, aircrafts have the nationality of the State in which they are registered, see Convention on International Civil Aviation (adopted 7 December 1944, entered into force 4 April 1947) 15 UNTS 295 (Chicago Convention) art 17.

51 Jeff Foust, 'Planet Ground Station Caught in Canadian Regulatory Limbo' (*Space News*, 11 July 2017) <<http://spacenews.com/planet-ground-station-caught-in-canadian-regulatory-limbo/>> accessed 24 September 2018.

investment treaties have not been extensively employed by the space industry to mitigate risks associated to investments. This may change in the future in the light of growing international investments by space companies and of international mergers and acquisitions.

Legal and regulatory issues are a significant risk for investments in NewSpace ventures, some of which are owed to an existing, but burdensome legal framework, whilst other are owed to the lack of a clear and predictable legal framework. Laws and regulations concerning commercial space activities are established in many countries, but they are currently reviewed and amended in the light of technology and market trends. Certain new services and applications are not yet addressed under national laws at all, or there is no consensus on their treatment at international level. Overall, there are significant uncertainties and/or evolutions regarding the legal framework in which space companies are operating. Companies along the value chain require different types of governmental approvals, including licenses under national space legislation, licenses under national telecommunications or media law, frequency assignments, market access authorizations, or export or import licenses. Delays in authorisation procedures and/or the denial or revocation of governmental approvals may have serious impacts on investments in space ventures.

As investment treaties provide for broad definitions of the term 'investment', there are many scenarios of investments along the value chain for commercial space activities that may theoretically fall under the scope of application of investment treaties. In practice, administrative rights are one of the most important assets for the implementation of space projects and the most eminent and likely area where space companies may present claims against a foreign government, for example, when a license is delayed, denied or revoked. The level of protection in relation to these administrative rights may differ from one investment treaty to another. However, even if administrative rights are not independently recognised as an 'investment' under the investment treaty in question, a company may present a claim, to the extent that another 'investment' in terms of the treaty is affected by a delay, denial or revocation of a license.

Some assets relevant for space activities, such as the upper stages of launchers, satellites orbiting in outer space, or ground equipment on board an aircraft in flight are in areas beyond the limits of national jurisdiction. It might still be possible to determine a host State for these scenarios, as a space object, respectively an aircraft in flight, can be allocated to the territory of the State of registry. It needs to be assessed whether there are factors other than registration or the location of the asset in question that may establish a territorial nexus to a host State for an investment. These and other questions will likely come into focus with the increasing commercialisation of, and the rise in foreign investments in, the global space industry.