

A Branch of International Law or an Undermining Factor to International Law: A Study on the Development of Space Law

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Contrary to traditional categorizations of law that generally based on a conceptual analysis, for instance contract law, law of intellectual property rights and so on are of such kind, space law is classified mainly attributed to the far-fetched area that is beyond the sovereignty rights of any states. Recognized as the “Magna Charta” of space law, the Outer Space Treaty stipulates that space activities carried out in outer space shall in accordance with international law, which has resulted in an unceasing clash of ideas about whether or not space law shall be taken as a branch of international law, which not only coming to the amid of international law but also within the space law field, while discussions and disputes can derive from 1970s. Considering the emerging trends of space activities carried out in the dimension of privatization and commercialization, which imposes significant impacts on space law development that takes form in three dimensions, public international law of space, domestic space law and private international law of space. In order to answer the question raised, this paper addresses in detail each dimension. Moreover, concerns regarding legal positivism in international law will also be taken into consideration in order to provide a more in-depth view of the relationship between space law and international law. The paper further addresses other current challenges for space law in this era of commercialization by using a comparative approach and makes some suggestions for the future development of space law.

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1 Introduction

Divergently from other branches of law division that mainly based on a conceptual analysis space law is classified accordingly to its unique spatial characteristic where non-appropriation and no sovereignty rights claim applies.¹ The unique attribute of space law perplexed the academia at the outset of the space era with a hot debate upon whether space law is an independent subject under law family or is affiliated with international law. Nevertheless, in the late 1960s, with formulating and enacting works of UN treaties on outer space where member States to the Treaty is obliged to “carry on activities in the exploration and use of outer space...in accordance with international law, including the Charter of the United Nations...”², Allegations upon space law as an independent subject confronts its logistical contradiction and further research works on the topic reinforced and highlighted that space law is a branch of international law.³ The proposed assumption to isolate space law as an independent subject mainly derives from a historical background when international regulatory frameworks were unavailable and intangible at the moment that some space-faring countries had the capability to send space objects into space, thus within the scope of the paper space law is taken into consideration under the certainty that it is a newly-born yet dynamic branch of international law. Nevertheless, after its origins in the 1960s, space law is confronting challenges from commercialization and privatization movement in space industries and some nations like the U.S. responded to the new trend with a national act as a pacesetter and the commercialization trend pushed space law to a new period where new challenges were discovered and some are being undertaken both at the international and regional level and at a domestic level. The paper is going to address current commercialization trends taken in space industries which are displayed in a diversity dimension from telecommunication satellites sector to launch service providers and even space tourism and planetary resources exploration. The paper further illustrates main legal challenges implied by the trend into three aspects where the question highlighted in the title will be answered in each subsector under the chapter. Before that, a clarification on how the second and the third chapter intersect with each other

1 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, 1967. (*Hereinafter as Outer Space Treaty, OST*) See OST art. II, “Outer 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.” Adopted by the General Assembly in its resolution 2222(XXI) of 19 December 1966.

2 See Outer Space Treaty Article III.

3 See Konstantinov, E. Space Law as A Branch of International Law, *Proceedings of the 35th Colloquium on the Law of Outer Space*, American Institute of Aeronautics and Astronautics 1993: 382-384.

See also, Malanczuk, P. Space Law as A Branch of International Law, *Netherlands Yearbook of International Law*, 1994: 143-179

need to be made. Commercial space activities leave the 1960s and 1970s space law regime lag behind it since the treaties take State parties as liable party and the responsible party for conducting supervision and licensing process. Consequently, national space legislation emerges as a bridge for the gap. Additionally, commercial space expands the application scope of space law from mainly public international space law regime to private international space law regime and considerations on the new trend will also be within the issues the paper is going to elucidate.

2 Commercialization in Space Industry as a Trend

At the beginning of the chapter, some terminology issues have to be clarified as they have been used in academia without a consensus on their explicit meaning, which generates confusions to our readers. The paper is not supposed to provide a standard meaning in general but rather for readers to understand their meanings better within the paper. Thus, the terminology “commercialization” is used as describing a trend of commercial activities. While “commercial” is combined with investment activities aiming at yield and a profitable market where it is isolated from non-profit activities. Though commercial activities are usually combined with the participation of private entities, however, it is not imperative that a commercial activity must have a private partner. Indeed, participations of private entities in space sector by far are commercially operated; it still cannot exclude the possibility that some of the private entities or personals may conduct an investment without a profit objective. Subsequently, “privatization” is addressed under the meaning of a transition from government-owned and operated to a private entity owned or merely operated activity. As an example of privatization, the successful privatization of the communications satellite sector is described in the following section.⁴

2.1 Commercialization in Communications Satellite Sector

INTELSAT, formerly in full International Telecommunications Satellite Consortium (1964-1973), and International Telecommunications Satellite Organization (1973-2001), is a communications satellite operator and a leading provider of satellite services worldwide that was launched by 18 nations based on an agreement on 20 August 1964. The organization had its member States accumulated from 18 gradually to 86 in 1973 and 148 in 2001, at which point it severed its ties with governments due to the unwieldy governing structure with 48-member board representing the diverse interests of 146 member countries and reviews pointed that it marked the end of a grand experiment in

4 All the selected space industries to be addressed in the subchapters hereinafter are based mainly on the maturity of the market within that sector and its impact on space law from a high to low level.

using government to grease the skids for private enterprise.⁵ Meanwhile, as one of the most competitive counterparts in fixed satellite services industry, Eutelsat Communications, a French-based telecommunications infrastructure provider that mainly orientates its market in Europe, though founded in 1977 as an intergovernmental organization,⁶ was transferred to Eutelsat S.A., a private company, the same year as INTELSAT did. The private company soon grouped its investment in a new entity called Eutelsat Communications, which is the holding company of the Group owning 96% of Eutelsat S.A. currently.⁷ Much earlier in 1985, Europe's first private satellite operator SES was inaugurated at a signing ceremony in Luxembourg, though was on the initiative and support of Luxembourg Government by large, which soon launched its first satellite ASTRA 1A with an ARIANE rocket. Consequently, three of the leading satellite operators in the world, in terms of revenues, completed their privatization process or formed in a private manner. However, the privatization and commercialization in communications satellite operators is not constrained to the listed operators, others like Inmarsat, which was originally set up at the behest of the International Maritime Organization as a non-profit international organization in 1979 and converted into a private company in 1999, is also an example of such kind.

2.2 Launch Services and Commercial Experiments

Another example from a success commercial space operation is the launch service, which imposes an important role for the revolution of space activity conducted from government-owned and operated to a private and commercially operated sector. These experiments in commercial space operation further impacts the development of space law, which lay a question of correct body for license and supervision. Also, a commercial market especially private participants are taking part in, will by no means allow a governmental support for their "competitors" in the market, thus a question on how to foster an efficient and fair market is yet another question left for space law.

5 New York Times online version, *see at*: <www.nytimes.com/2001/07/23/business/technology-satellite-company-is-trying-life-on-its-own.html?scp=1&csq=collections%20intelsat%202001&st=cse>. Over the years, those connections brought Intelsat such high-level jobs as providing the original hot-line phone link between the White House and the Kremlin and broadcasting worldwide Neil Armstrong's walk on the moon. Intelsat became so entrenched in global telecommunications that as of last year, 70 of its 146 member countries reported that they relied on it for all international telecommunications and 40 used it for domestic links, as well. Last accessed 10 August 2012.

6 Full name at the time founded was "European Telecommunications Satellite Organization".

7 Detailed history of Eutelsat Communications can be *checked at*: <www.eutelsat.com/eutelsat/history.html>. However, the percentage was updated from 93% shown on the website into 95.2% based on a "Consolidated Financial Statement" by Eutelsat Communications Group on 30 June 2009. <www.eutelsat.com/investors/pdf/ETL-consolidated-financial-statements-300609.pdf>.

Launch service providers that currently operating commercial launch services are 15 in total to date.⁸ Among them, three models can be driven from a case study based on the following enterprises, SpaceX, United Launch Alliance (ULA) and Arianespace. The very first model represents a full-scale private owned and commercially operated venture. SpaceX with its founding investment utterly from Elon Musk, former co-founder of Paypal, who deeply believes the high prices of other launch service suppliers are driven partially by unnecessary bureaucracy, established in 2002 and is recently reported as already turns a profit as it works through its backlog of orders.⁹ Following up model can be exemplified from ULA, which is a joint venture of Lockheed Martin and Boeing, though the company was commercially operated, its close connection with governmental organizations which basically merges the production of the former services provided by government into one central plant and the fact that its primary customers listed as NASA and Department of Defense of U.S. also extinguishes it from the SpaceX commercial Model. Instance from the world's first commercial space transportation enterprise, Arianespace, which accounting for over half of the market share stands for another model. Though two main shareholders of Arianespace, CNES and EADS, are utterly not private investment, where SpaceX model scarcely applied, still difficulties might be met when filling it into the second model where its customers are diversely ranged. Critical issue raised here is how to make a delicate balance among commercial launch service suppliers originating from separate models, taking into consideration of challenges from SpaceX on antitrust legality of the launch services monopoly against ULA.¹⁰ Additionally, with the development of commercialization in the sector, more issues will be proposed and have to confront with.

8 They are Antrix Corporation Limited (India), Arianespace (France), China Aerospace Science and Technology Corporation (China), COSMOS International (Russian-German), Eurockot Launch Services (EADS Astrium-Russia), International Launch Services (US-Russia), ISC Kosmotras (Russia), Khartron (Ukraine), Land Launch (Sea Launch), Orbital Sciences Corporation (U.S.), Sea Launch (U.S.-Russia-Norway-Ukraine), Space X (U.S.), Starsem (Europe-Russia), United Launch Alliance (U.S.). *Notes:* The Country listed after each is just the headquarter location of the company, and those with more than one country listed means it is a joint-venture among the listed countries. Sources can be *seen also at:* <http://en.wikipedia.org/wiki/Category:Commercial_launch_service_providers>. Last accessed 5 September 2012.

9 *See at:* <www.businessweek.com/articles/2012-09-13/elon-musk-the-21st-century-industrialist#p4>. Last accessed 14 September 2012. Additionally, SpaceX was offered a contract from NASA COTS program, and it successfully demonstrated the first private launch, orbit and recover spacecraft in 2010. Subsequently, in 22 May 2012, it unprecedentedly docked its unmanned, cone-shaped Dragon capsule with its Falcon 9 Launch vehicle, which marked the first private company that ever sent a spacecraft to space station.

10 The challenge ended up with the Department of Defense giving preliminary approval to ULA.

2.3 Other Emerging Commercial Space Markets

Most recently, space market meets its newly joined members, which makes it a more diverse, dynamic and prospect arena towards an in-depth expansion in space, where two of them, space tourism and planetary resources exploitation, emerged with not yet full-fledged wings acquired worldwide attention and doubts accompanying. Virgin Galactic, founded in 2004, though not the first to provide a spaceflight among all the early birds in space tourism market, is the most striking one by affording a suborbital spaceflight with an experience of zero gravity to its customers. Others like Zero 2 Infinite, a private company with the motivation to pioneer private near-space flight in a balloon, which awakens consciousness of its customers on the vast curve of the Earth and the unique, fragile beauty of our planet;¹¹ Bigelow Aerospace, created by Robert T. Bigelow, is another private experiment in space tourism sector with the express purpose of revolutionizing space commerce via the development of affordable, reliable and robust expandable space habitats.¹² On the other hand, thither voices come from planetary resources exploitation sector, where being led by Planet Resource Recovery, Inc., a Texas-based private company, founded in 2005 that envisions to develop new-age chemical compounds for maximum economic recovery of our planet's resources;¹³ and furthermore, several companies set their destinations beyond LEO and extend to the Moon or Mars and root their future businesses in both sectors, like Excalibur Almaz, also a private company that sets its goal at lunar exploration and is building a space program that offer the affordable and reliable transportation of humans and cargo to Low Earth Orbit, libration point, the Moon and beyond.¹⁴ Though no ultimate lists for all the commercial participants in the sector can be created since both of the sectors demonstrate a high-profit potentiality and attractiveness from private investigators.¹⁵

Hints from the evolution of the communications satellite sector and other sectors was that space as a high risk, numerous and lifelong investment industry, was initiated through intergovernmental collaboration and once the market is mature and visible profit can be generated, privatization and commercialization follow, or for the time being, a considerable output can be estimated and evaluated, private or commercial entities will soon show up, which was a significant transition in space industry and has a profound impact on space law evolution as well. While entrance from private participants in space sectors generates problem like licensing, supervision and most importantly liability and insurance issues, which relies on national legislation and domestic regulations by far, for instance FAA

11 See at: <www.inbloon.com>. Note: Zero 2 Infinite is the company and Inbloon is the first project from the company.

12 See at: <www.bigelowaerospace.com>. Next Generation Commercial Space Stations.

13 See at: <www.planetresource.net/index.html>.

14 See at: <www.excaliburalmaz.com>, and <<http://travel.nytimes.com/2012/09/09/travel/space-tourism-is-here-wealthy-adventurers-wanted.html?pagewanted=1&r=2>>. Last accessed on 05 September 2012.

15 Others like Moon Express, Inc. NanoRacks LLC, Shackleton Energy Company,

Office of Commercial Space Transportation which regulates commercial launch and reentry activities by U.S. commercial space transportation industry. Problems and debates derived from the boom in national space legislations and its impact on space law required to figure out. Other issues like is the lack of internationally binding instruments and the soft law environment shall be taken as a failure of space law, and is there a need for us to initiate a private international space law?

3 Legal Implications

Concomitant with the commercial evolution of the space industry directing at a commercialization and privatization trend, a major theme in the evolution of space law has been the transformation of it from its original pro-state, military, and governmental emphases into a legal regime that accommodates and encourages private, commercial, transnational, and multinational activities in space.¹⁶ Nevertheless, stepping into the era of a commercialization and privatization of space industry, the highly and rapidly developed arena leaves the 1960s and 1970s legal regime staggering far behind and no effective hints of bridging the gap has been shown as national interests differ making it exceedingly difficult to arrive at a consensus or an agreement in international society. On the other hand, legal implications indicating the development of space regulation regime in response to the commercialization trend in space industry has been elucidated by scholars, where space law is either cited as “applied space law”¹⁷ or discussed as being split into public international law of space, private international law of space and domestic space law.¹⁸ This chapter will firstly address recent development of space law towards a “soft law” direction, which is current fact and then further discuss how does commercial space activities influence space law in the national space legislation process, then follows by illustration on the private international space law dimension.

3.1 A “Soft Law” Period in Contemporary Space Law Regime

Ever since 1979 the last space treaty on the Moon and other celestial bodies¹⁹ (*hereinafter as Moon Agreement*) was approved by consensus in UNCOPUOS, no treaties or “hard” law have ever been formulated or enacted over the past

16 Goldman, N. C. Space Law in Sadeh, E. (Ed.), *Space Politics and Policy: An Evolutionary Perspective* Kluwer Academic Publisher, 2002: 163.

17 Lyall, F. Space Law – What Law or Which Law? *Proceedings of the 34th Colloquium on the Law of Outer Space*, American Institute of Aeronautics and Astronautics 1992: 240.

18 *See above* Lyall, F. (1992) made the 3 divisions by using the term of “municipal laws of space”; *See above* Goldman, N. C. (2002) discussed as “private international space law” and “domestic space law”.

19 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 1979. Adopted by the General Assembly in its resolution 34/68 of 5 December 1979. *See link for States signed and ratified the Agreement:* http://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&cmdsg_no=XXIV-2&chapter=24&lang=en.

three decades. Attempts on advancing and enhancing the space regulation framework was exercised though, due to the divergence of view as to the concise interpretations of space provisions and a variety of States interests concomitant with emerging private space entities involved in space activities, meanwhile UNCOPUOS is undergoing a shift of its role from an international law-maker, promulgating norms based on consensus, to an idea and information exchange “forum” for member States more likely, where the pivotal transition is stipulated in 1996 the Declaration on International Cooperation article 7, “The Committee...should be strengthened in its role, among others, as a forum for the exchange of information on national and international activities in the field of international cooperation...”.²⁰

Concerns about the procrastination or even non-productiveness space law making process are proposed as evidence that space law is facing a hiatus and enquiries upon the non-binding effects of resolutions, declarations and protocols regulating outer space activities add no value to the international society raise concurrently. Back to the origins of public international law when questions upon the same issue that criticizing public international law is scarcely even law with a lack of binding effect upon States. A glance of the evolution of legal positivism from its predecessor John Austin, whose theory basically characterized as a “command theory” that excluding international law from “the province of jurisprudence” based on a criteria set out in his influential lectures²¹, which is later being criticized for its oversimplification on the relationship between law and coercion and being modified by his successor H.L.A. Hart with his extraordinary masterpiece on “concept of law”, where international law is positioned back to law province by conducting an analysis on the differentiation amid “coercive order” and “obligation”. He addressed, “to argue that international law is not binding because of its lack of organized sanctions is tacitly to accept the analysis of obligation contained in the theory that law is essentially a matter

20 Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries. Adopted by the General Assembly in its resolution 51/122 of 13 December 1996.

21 Austin, J. *The Province of Jurisprudence Determined*. Cambridge University Press 1995. The criteria set by John Austin can be summarized as follows: 1) “Commands” involve an expressed wish that something be done, combined with a willingness and ability to impose “an evil” if that wish is not complied with; 2) Rules are general commands as contrasted with specific or individual commands; 3) Positive law consists of those commands laid down by a sovereign (or its agents); 4) The “sovereign” is defined as a person (or determinate body of persons) who receives habitual obedience from the bulk of the population, but who does not habitually obey any other (earthly) person or institution. 5) Positive law should also be contrasted with “laws by a close analogy” (which includes positive morality, laws of honor, international law, customary law, and constitutional law) and “laws by remote analogy” (e.g., the laws of physics). *See at:* <<http://plato.stanford.edu/entries/austin-john/>>. last accessed on 10 September 2012.

of orders backed by threats.”²² Moreover, Thomas Franck addressed at ASIL Annual Meeting in 2009 that the doubt on international law is law primarily of interest to Americans, who have come of age in the post-cold war era believing in American exceptionalism, and law is always an encumbrance to the strong.²³ Consequently, dissidents on “soft law” as a functioning international legal framework in outer space exploration activities will be a renunciation on the established theoretical work over the last century. For the “soft law” period in space law evolution, non-binding resolutions acted as a “latent hand” for State exploration and exploitation activities in outer space and concomitant with States practice repeatedly and unanimously, certain guidelines is plausibly anticipated to enter into international customary law, which will be an acting source of international law. Examples derived from the primitive stage of space era when the first space object Sputnik 1 was placed in orbit by Soviet Union in 1957 where no States claimed their sovereignty over the area that the satellite passed and so did the silence among international society over other space objects sent into the far-fetched area by other States, which was soon adopted in the provision of Outer Space Treaty in 1967 and later being extracted as principles of free entry, exploration and non-appropriation of outer and other celestial bodies. However, the precedent example was an ongoing expansion over the previously assumed unattainable area where no existing rules would possibly be found in the history of humankind and analogies to municipal laws simply manifest to be in vain; and “soft law” in the period shall be taken seriously from an inner perspective of the space law evolution that it might lead to a codification in international treaty with numerous endeavors.

3.2 National Regulatory Frameworks for Space Activities

In response to the commercialization trend in space exploration and exploitation activities, national space legislation either seeks its path as a foresight for a potential need required from commercialized space market or implements in parallel with the advent of the commercial trend, and up to date the list of States with a national legal instruments, not necessarily appear in form of a national legislation, stands at twenty five.²⁴ The escalation in the formulation of legal instruments at a national level is not simply combined with current international circumstances where soft law as an approach is inextricable, but rather backed with a national strategy rationale since most of the space-faring nations embarking with commercial space industries are member parties to space treaties

22 H.L.A., Hart. *The Concept of Law*. Oxford University Press, 1997: 217.

23 Franck, T. In *What Sense is International Law Law?* ASIL Annual Meeting, 6 March 2009. See at: <www.asil.org/files/ThomasFranckRemarks.pdf> last accessed on 14 September 2012.

24 The number is summarized according to *Schematic Overview of National Regulatory Frameworks for Space Activities*. Committee on the Peaceful Uses of Outer Space Legal Subcommittee Fifty-first session, 19-30 March 2012, Item 12 of the provisional agenda, General Exchange of Information on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space. A/AC.105/C.2/2012/CRP.8.

and taking into consideration of article VI, VII of Outer Space Treaty²⁵ and the strict “absolute liability” provision under Liability Convention²⁶, all legislation incorporate the aim of implementing the international obligations on space affairs to which they are signatories and therefore they have all regulated the obligations to obtain authorization, registration, supervisory action and liability conditions.²⁷ As provisions themselves provide no mechanism for proceeding with such authorization and supervision, but simply imposes the obligation on States to do so, thus a national legislation to balance the international requirements and domestic commercial space markets is utterly a necessity. For those whose space market is yet immature but with a national legal framework on space is under another rationale that space legislations adopted after commercial activities have been developed, or the introduction of changes into existing law may have adverse consequences where the State indemnification foreseen by the Commercial Space Launch Act illustrates the case.²⁸ With the swiftly developed national regulatory frameworks for space activities, challenges have been raised recently with regard to the divergence of national legal frameworks where a diversity legal background and a variety of national interests are stretched out, therefore another key concept “harmonisation” come into sight²⁹ though the terminology itself requires an in-depth clarification. In the foreseeable future, potential problems like “license harbor” where

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- 25 Outer Space Treaty article VI regulates that “State Parties to the treaty shall bear international responsibility for national activities in outer space...The activities of non-governmental entities in outer space...shall require authorization and continuing supervision by the appropriate State Party to the Treaty...” and article VII accordingly stipulates that Launching State is “internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts...”.
- 26 Convention on International Liability for Damage Caused by Space Objects, Adopted by the General Assembly in its resolution 2777 (XXVI) of 29 November 1971 (*Hereinafter as Liability Convention*). Article II of Liability Convention addresses: “A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the Earth or to aircraft in flight.”
- 27 Aranzamendi, M. S., Schrogl, K-W. Economic and Political Impacts of National Space Legislation in Europe. *Proceedings of the 52nd Colloquium on the Law of Outer Space*, American Institute of Aeronautics and Astronautics 2010: 379.
- 28 *See above* Pp 381. “State indemnification was introduced as a measure to increase competitiveness of space launch activities in the U.S. with the aim of possibly removing such clause once the sector was mature. The state indemnification is now being put to the test and it is observed that the removal of such measure would ‘kill the market’ as operators would be more attracted to launch with in other countries offering such warranty.”
- 29 *See* Hobe, S., Schmidt-Tedd, B., Schrogl, K-W. (Eds.) *Proceedings of the Project 2001 Plus-Workshop “Towards a Harmonised Approach for National Space Legislation in Europe”*, 29/30 January 2004, Berlin, Germany. Deutsches Zentrum fuer Luft- und Raumfahrt (DLR) e.V.

private entities might crowd in States that favorable warranty and policies are implemented and a delicate balance among national space legislations worldwide will be acquired, also the nurture of space market relies on an open and liberal domestic market where no governmental subsidies will be imposed on as an advantage against foreign competitors. However, as illustrated, an international codification or standard is impractical and unfeasible at the time being in consequence, a regional collaboration and endeavors is a tangible substitute, dynamic discussions and active efforts taken within Europe demonstrates the demand, which is initiatively established as the European Cooperation for Space Standardization (ECSS) to develop a coherent, single set of user-friendly standards at the disposal of the European space community.³⁰ Apart from the regional standard efforts to be input, another issue to be stressed on is national legislation framework shall by no means be a hurdle for commercial activities that has already been taken.³¹ Seemingly, progressive step gained from harmonisation of regional legal frameworks is rather an untiring advocate of space law not an adverse element. Additionally, with regards to governmental subsidiary conduct, which happens occasionally in current space markets, as shown from the second chapter, concerns shall be drawn on how to regulate governmental activities in this approach and that will be an international endeavor so as to secure a liberal and partners being equally treated market, which will be a breakthrough for further nurturing commercialization in space industries.

3.3 Private International Space Law

Concomitantly with the commercialization trends and experiments prevails the formerly stated-monopolized space-related market, perspectives from international business call for some uniformity for private and commercial rules, some conclude that uniformity will not spontaneously spring from its own necessity with the help of arbitral tribunals and ensured such a fact will only be realized by relying on a concerted action, while the most classical way, that of the international conventions.³² Others driven by the idea that without comparable limits in private international law, it would be easy for the parties to circumvent the all internal mandatory rules by just choosing a foreign law, propose mandatory rules in international contracts.³³ Influentially affected by opinions from private

30 Jain, Andreas. K., Kriedte, W. European Cooperation of Space Standardization (ECSS) and its Capability to Support National Space Legislation. *See above* Hobe, S., Schmidt-Tedd, B., Schrogl, K-W. (Eds.) *Proceedings of the Project 2001 Plus-Workshop*. pp. 87. More information *see at*: <www.ecss.nl>.

31 Paper in favor of this can be *seen from* Kaul, R. Legal Mechanism for Encouraging Space Commerce: The Indian Model. *Proceedings of the 52nd Colloquium on the Law of Outer Space*, American Institute of Aeronautics and Astronautics 2010: 342.

32 Mayer, P. Perspectives of Private and Commercial Law Rules for International Business. In Boeckstiegel, K-H. (Ed.) *Perspectives of Air Law, Space Law, and International Business Law for the Next Century*. Carl Heymanns Verlag KG 1996:86.

33 Kroell, S. Future Perspectives of Conflicts Mandatory Rules in International Contracts. *See above*, pp. 87-105.

international law area, scholars in space law recommend the creation of private international space law,³⁴ and grand attentions accumulated in security interests for space assets. UNIDROIT, the International Institute for Unification of Private Law, initiated endeavors on a space assets protocol more than a decade ago and announced the preliminary draft to be in sufficiently stable shape to go through a diplomatic conference, which was recently hosted at Berlin, Germany from 27 February to 9 March, 2012.³⁵ Circumfusing the draft protocol and the call for a diplomatic conference, which customarily the final stage for an international agreement to be reached, Satellite operators almost unanimously oppose such a protocol to even being discussed in the conference and academia area also raised some opponent comments for the protocol.³⁶ All these negative responses urge us to reflect whether it is the accurate timing for us to introduce such an international instrument in space area or the issue to enact one is just a “pseudoscience”. Within the scope of commercial launch sector, the first launch services agreements (LSAs), a commercial contract, proposed for consideration by NASA to non-governmental customers, have been used as models by the launch services providers even if competition among them may have induced some adaption, limited to commercial aspects, initial basics imposed by the nature and specificities of launch activities have been unchanged by the newcomers.³⁷ Whereas, no formally set-up standards that are internationally effective, launch services suppliers and their contractors, in most cases satellite operators and governmental demands, operate under bilaterally or multilaterally binding agreements among contracting parties, yet a critical and necessary concern on dispute settlement shall be duly regarded. An optional rules for the arbitration of space disputes adopted by the Permanent Court of Arbitration might be a substitute, however, considering the current circumstances of space law development, an optional standard or internationally applicable rules are hard to make a progress. Consequently, further endeavors towards the establishment of rules of this kind is recommended but still depends on the general circumstances. Similarly as dispute settlement in private international law sector, arbitral organizations might

34 Von der Dunk, F. The Need for Regulation of Private National Space Activities. *Journal of Space Law* 24 (1996): 27-29.

35 Detailed info can be seen at: <www.unidroit.org/english/workprogramme/study072/spaceprotocol/conference/background.htm>. Last accessed 10 September 2012.

36 Before the diplomatic conference to be hosted in Berlin, Global Satellite Industry (GSI) reiterates opposition to UNIDROIT Space Assets Protocol. See at: <www.sia.org/wp-content/uploads/2012/02/UnidroitPR_2012_02_23_final.pdf>. Last accessed on 10 September 2012.
Also see at: <www.satellitetoday.com/via/globalreg/37894.html>. Last accessed on 10 September 2012.

37 du Parquet, C-A. Specific Clauses of Launch Services Agreements. In Smith, Lesley J., Baumann, I. (Eds.) *Contracting for Space: Contract Practice in the European Space Sector*. Ashgate Publishing Limited 2011: 385.

be a future solution for conflicts occurred and for future steps on private international space law. So far as to the scope of private international space law, a gradually movement with resonate pace to current industrial status is recommended, where thoroughly investigation and research works shall be made.

4 Conclusion

Commercialization in space industries is developed in numerous dimensions and with diverse approaches, thus it is indeed an impossible work to ultimate them taking into consideration that it will keep the escalation in the future. Influences from the new trend in space industries do shed some significant challenges for us to take an insight into the legal regime and properly make some adjustment accordingly. Space law as a branch of international law by confronting with all the challenges from space practices has some new trends in its evolution. The current “soft law” period for space law, domestic regulations and private international space law development have displaced international treaty law as the primary nature of space law. In the future, within each sub-branch, a soft-law circumstances in international space society might not be changed, more countries will enact and have a national space legislation, and private international space law though may not be a proper timing to initiate a uniformed instrument, may develop some organs in the international space society to function as a dispute settlement third-party.