

Public Procurement Rules, Forms of Financing and Their Impact on Competition in the Space Field: A General Overview with a Focus on the Italian Legislative Framework and Its Practical Implementation

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1. Introduction

According to its peculiarities, space sector is characterised by a strong presence of public entities and a low degree of competition between private operators. Although private investors are significantly increasing in recent years, public resources still form a substantial part of funding for space programmes. This aspect makes public procurement rules and other forms of public financing, like State aid, particularly important for the technological development and the growth of the space sector as a whole.

In view of the above, this paper will initially present a general overview on the space sector and its peculiarities, the main actors involved in space programmes and the degree of competition (paragraph 2). Furthermore, there will be a deepening on the different forms of financing space activities with a focus on public procurement rules and State aid (paragraph 3). Finally, the Italian legislative framework in the field of public procurement as well as the main types of contracts and forms of funding space programmes put in place by the Italian Space Agency will be shortly described (paragraph 4).

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2. Space sector and competition

2.1. The role of public and private actors in the space field

In the field of space activities, public entities have always played a crucial role considering the huge development costs, the high financial and technological risks as well as the high barriers to entry. Therefore, space activities have traditionally been undertaken by governmental entities given that, at the beginning, only States had the technical and financial capacities to carry out the exploration and use of outer space. Initially, the space sector was exclusively government-driven due to the focus on national security concerns and to the huge risks associated with investments in space.¹ Therefore, in general, while public entities were the main actors and the only clients for space products and services, industries and private actors were involved only in the manufacture of space products. This was because, for many years, space was not considered as an economic sector as such but rather as a limited scientific and technological domain.

Since then, however, many changes have occurred and the space sector has been constantly evolving. In fact, with the privatization and commercialization of space activities – started in the 1980s and 1990s – the role of private actors have totally changed². Thanks to the technological progress and due to the need for States to find supplementary sources to finance space activities, private operators entered the space market,³ acting not only as manufacturers and suppliers of space products, but also as operators and owners of space systems.⁴ Moreover, the space applications, in which private actors are involved, have gradually increased and become diversified. In fact, they have started to provide services not only in the telecommunications field but also, for instance, in the Earth Observation or launch sectors. In addition, given the recent technological developments (i.e. miniaturisation) and the chances in the manufacturing process, the use of small satellites has become very common, often associated with the concept of mega-constellations. It follows from the above that the gradual privatization of a few specific areas of space activities has favoured the

1 Christian Brunner, Alexander Soucek, “*Outer Space in Society, Politics and Law*”, ESPI, Springer Wien New York, 2011, p. 55.

2 Christian Brunner, Alexander Soucek, already mentioned in reference 1; Fabio Tronchetti, “*Fundamentals of Space Law and Policy*”, Springer, New York – Heidelberg – Dordrecht - London, 2013, pp. 60-63.

3 Some of the intergovernmental organizations active in the satellite communications sector, such as INMARSAT, INTELSAT and Eutelsat, were transformed into private companies in the early 2000s.

4 OECD, “Space 2030: Exploring the future of space applications” 2004; Marina Gagliardi, Gianfranco Gabriele Nucera, Nicoletta Bini, Cristina Marabottini, “*New space activities and legislation: a general overview with a specific reference to the ongoing debate in Italy*”, IAC 2017 - E7,2,13x41339, 68th International Astronautical Congress, Adelaide, Australia, 2017, 24-29 September.

development of private customers for space systems. Hence, with the advent of private satellite operators, space manufacturing industries have added new customers on top of their core business next to institutional customers.

However, despite the increasing number of private operators in the space sector, public entities remain the major players in financing and promoting space activities and projects, considering the fact that space activities usually require large upfront investments and long-term funding commitments. In fact, the high costs and technological risks - related to system failures - still justify public intervention in funding space programmes and innovation.⁵ In particular, the involvement of governments in space activities occurs in three different ways: (i) R&D and space system development activities; (ii) Purchase of space goods and products, also considering their strategic value; (iii) Definition of the national legislation to set-up the framework conditions for private space activities.

In conclusion, there are different reasons why States maintain a central role in space activities. Firstly, space applications are of utmost strategic importance, as they can contribute to a wide range of public goals. Moreover, space technologies are often dual-use and this aspect implies that they have a strong military and security potential. Finally, the necessary investments and economic risks are so high that it is difficult for single private actors to carry out these activities alone.

2.2. Peculiarities and degree of competition in the space sector

The main components of the space sector structure are the upstream sector and the downstream sector. The first includes research, manufacturing and ground segment (e.g. fundamental and applied research activities, scientific and engineering support activities, material and components supply, manufacturing of space systems, subsystems and equipment, launch activities, telemetry, tracking and command stations). The second consists mainly of satellite services, which rely on satellite technology, signal or data to function (e.g. satellite broadcasting, selected GIS, GPS-enabled devices). Recently, on the basis of the space economy definition⁶ provided by the OECD,⁷ the downstream sector includes also the space-related-segment (i.e. space

5 OECD (2016), *Space and Innovation*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264264014-en>, p.62-63.

6 In broad terms, the OECD Global Forum on Space Economics defines the space economy as: “*All public and private actors involved in developing and providing space-enabled products and services. It comprises a long value-added chain, starting with research and development actors and manufacturers of space hardware (e.g. launch vehicles, satellites, ground stations) and ending with the providers of space-enabled products (e.g. navigation equipment, satellite phones) and services (e.g. satellite-based meteorological services or direct-to-home video services) to final users*”.

7 OECD (2007), “*The Space Economy at a Glance 2007*”, OECD Publishing, Paris, <https://doi.org/10.1787/9789264040847-en>.

application, products and services as well as technology transfer from the space sector, which use satellite technology but do not depend on it).

The development and operation of a space mission typically brings together various players such as: (i) the space mission owners; (ii) manufacturers; (iii) subcontractor of the manufacturers; (iv) the launch service provider; (v) the operator, (vi) other service providers; (vii) clients/users. Despite the fact that space missions rely on the interaction of many different actors, space sector is not comparable with usual business due to the central role of governments and to some specific structural characteristics.⁸ In fact, as it will be better set out in the following paragraphs, the peculiarities of space programmes imply a series of challenges for space operators.

One of the central aspect is the long development cycles of space projects. This entails (i) not only the risks of the extension of the implementation schedule and the resulting increase of the costs (ii) but also the market risks, since the market potential for new applications needs to be assessed long in advance and a wrong evaluation can lead to resounding failures. Moreover, the long operational life of space assets makes it very difficult to quickly adjust the supply to a changing demand. Another important feature relates to the fact that space technologies are dual-use by nature, as they can be used both for civilian and military purposes. The high sensitivity of these assets could bring governments to interfere with private activities for instance through dual use and arms control regulations.⁹ A further issue concerns the high costs of access to space. This cost problem is particularly relevant in the launch services sector, but it can be generalized to the whole upstream segment, given that the complexity of technical issues in any space-related project implies very high R&D costs. Finally, we have to consider the topic of economies of scale. While large economies of scale are possible in the downstream sector, in the upstream sector high fixed costs - due to R&D investments, the long development time and the small size of the market - prevent the creation of economies of scale. In addition, considering that (i) the high entry costs represent a market barrier, (ii) the operation of space assets involves low marginal costs and (iii) some space applications can serve a large number of additional clients at costs close to zero, bigger industries are more likely to be economically viable. All the aspects listed above, encourage a tendency towards a high concentration in the market, which means that a small number of large firms influences the production or services provided in the space market and the industry then is generally oligopolistic or, in some cases, even monopolistic, especially at regional level.¹⁰

8 See OECD (2014), *The Space Economy at a Glance 2014*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264217294-en>.

9 Christian Brunner, Alexander Soucek, already mentioned in reference 1, pp. 61-62.

10 OECD (2012), *OECD Handbook on Measuring the Space Economy*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264169166-en>. pp. 40 et seq.

3. Forms of funding space activities and the role of public entities

3.1 General overview of the forms of funding in the private sector

As highlighted in paragraph 2, government bodies play a key role in the space sector – especially in the upstream segments - as developers, investors, owners, operators, regulators and customers for many of space infrastructures. Public investment in space has not only enabled the emergence of a considerable and dynamic market for space-based services and products but also fostered the development of private industry competing on some market segments. In this new context, a commercially driven approach has emerged and private actors are playing a more prominent role, pursuing the goal of conducting space business independently from governments. Given the capital-intensive nature of the space industry, financing is invariably a critical component of a successful venture. The type of transactions involved in financing space ventures vary and the more common forms, used to raise capital, are equity finance, secured and unsecured lending and project finance. On the one hand, funds can be raised by equity finance that is to say through sale of company's shares of stock. This stock can be sold through public offerings in a stock exchange or through private offerings to individuals or companies. On the other hand, funds can also be raised by borrowing money from a bank. Such loans can be unsecured, so that banks have no right to the borrower's assets if the borrower fails to repay or, more typically, the loans can be secured on the assets of the borrower in order to provide the banks with some protection in the event of default. Finally, another method of financing capital-intensive ventures is the project finance, in which the lenders financing the project rely on the revenue generated by the project for repayment of the debt obligations, without recourse to the company sponsoring the project. This structure appeals the companies because it limits the company's potential losses to the value of the assets involved in the project.¹¹

Apart from public institutions, the main types of investors are: (i) business angels, (ii) venture capitalists, (iii) private equity firms, (iv) corporations and (v) banks.¹²

Typically, angel investors are individuals or families who use their personal wealth to provide capital to start-up and early-stage businesses in return for a share of the company's equity. Time horizons for angel investors – meaning

11 Frans von der Dunk, Fabio Tronchetti, *“Handbook of space law”*, Edward Elgar Publishing Limited, Cheltenham (UK), 2015, pp. 874-909.

12 Bryce Space and Technology (formerly Tauri Group Space and Technology), *“Start-up Space 2018”*, available at https://brycotech.com/downloads/Bryce_Start_Up_Space_2018.pdf (accessed 10.09.2018); Alessandra Vernile, *The Rise of Private Actors in the Space Sector*, ESPL, Springer International Publishing, 2018; OECD (2016), *Space and Innovation*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264264014-en>. p. 78.

the time taken to realize their return – are about five to seven years from the date of the investment. Moreover, it is also worthy of mention that there is a highly visible special category of angel investors in the space ecosystem, consisting of billionaires and other ultra-high net worth individuals who have personally staked new space companies.¹³

In addition, space-oriented venture capital firms are emerging in the recent years.¹⁴ Venture capital firms are groups of investors that invest in start-up, early stage, and growth companies with high growth potential, and accept a significant degree of risk. The investment form of venture capital is equity and the preferred instrument is buying stock, which gives the venture capital firm an equity ownership stake in the company, with a higher priority compared to the one of the investors at common equity (e.g., founders, employees, and angels) and a lower priority relating to any holder of the company debt. Differently from Venture capital funds, private equity firms are formed by investors who aim to directly invest in established companies (not start-ups) at large transaction sizes and often acquire an entire company or a group of related companies that can merge. The larger investment firms have shown interest in space over the past 15 years, typically in the telecommunications industry.

In addition, it is worthy of mention that a notable role is also played by investments from corporations and their role has grown over the last years. In particular, corporations usually help new companies to become operative on the markets offering financial support for R&D programmes, manufacturing and others areas that would give a competitive advantage to the company. Moreover, corporations tend also to acquire firms. In the space field, corporations have often provided the funding necessary to bring space-based programs to initial operating capability as well as to sustain on-going programs.¹⁵

Finally, banks have always played an important role in financing space activities. In fact, banks have been heavily involved in providing funding for

13 These investors - defined by Bryce as super angels - have already made their mark in technology-driven enterprises, and include, for instance, Jeff Bezos of Blue Origin (Amazon), Elon Musk of SpaceX (PayPal), and Paul Allen of Stratolaunch (Microsoft).

14 Examples of Space-oriented Venture Capital funds are: (i) Starburst Ventures, an extension of Starburst Accelerator, which in 2016 raised a \$200 million fund to invest in 35 start-up space ventures over the next three years; (ii) Seraphim Space Fund which is a \$95 million space-focused fund, whose investors include Surrey Satellite Technology, Telespazio, Teledyne, Rolta, First Derivatives, The British Business Bank, the European Space Agency, and the U.K.'s Satellite Application Catapult; (iii) in 2015, Bessemer Venture Partners announced a fund, BVP IX, to invest in innovative companies, including the space sector.

15 See Bryce Space and Technology (formerly Tauri Group Space and Technology), already mentioned in reference 13, pp. et seq.

space-based programs of large, established firms during the past years. The basic model is that equity investors provide a substantial part of the total capital expense while the remainder of capital expenditure is financed by debt, sometime in the form of convertible debt.

3.2 The public funding forms of space programmes: contracts and public procurement rules

Among the main instruments, which public entities can use in order to carry out space programs, there are public contracts, awarded through public procurement procedures. Public procurement across the European Union's Single Market is defined as the process of buying works, goods or services by contracting authorities from private actors in a transparent, fair, and competitive manner, which generates business opportunities, increases competition, and drives economic growth of the Single Market. Public procurement policy must ensure an efficient use of public funds and an open European Union-wide procurement market. Of its goals, the most important is to achieve value for money by promoting competition and ensuring the integrity and transparency of the procedures. Economically speaking, public procurement is of great importance in most developed countries. In fact, public procurement represents 12% of gross domestic product (GDP) and 29% of total government expenditures on average across OECD countries.¹⁶ In European Union it accounts for approximately 14% of GDP.¹⁷ Public purchasing is not only economically important, but it is often used consciously as an instrument of public policy. Thus, public procurement can be used to promote environmental solutions through green purchasing or the development of competitive markets, particularly where market failures are present. Lately, a lot of focus has been directed toward the possibility to use public purchasing as a tool to promote innovation and to provide lead markets.

Public procurement is strictly regulated by international regulations as well as national rules and procedures. Public procurement rules aim to promote fair and open competition and minimise the risk of discrimination and fraud when a contract is awarded by a public entity (so-called Contracting Authority). In particular, public procurement in the European Union is subject to the principles of the Treaty of the Functioning of the European Union - TFEU (such as equal treatment, non-discrimination, mutual recognition, proportionality and transparency) and to the detailed provisions of the EU public procurement Directives coordinating the national

16 OECD (2017), *Public Procurement for Innovation: Good Practices and Strategies*, OECD Public Governance Reviews, OECD Publishing, Paris, <https://doi.org/10.1787/9789264265820-en>.

17 European Commission, *Public Procurement*, available at https://ec.europa.eu/growth/single-market/public-procurement_en (accessed 11.09.2018).

procurement rules.¹⁸ The modernisation of the Public Procurement Directives in 2014 included, *inter alia*, new provisions relating to innovation, included among the strategic goals of procurement, alongside green procurement and social procurement.

According to the European Law, contracting authorities must award public contracts applying the procedures provide for in the Directive 2014/24/UE. The basic ones are open or restricted procedures. However, in the specific circumstances expressly provided for in Article 30 of the Directive 2014/24/EU, contracting authorities may award their public contracts by means of the competitive dialogue. Moreover, in the specific cases referred to expressly in Articles 29 and 32 of the Directive 2014/24/EU, they may apply a competitive procedure with negotiation or a negotiated procedure without prior publication of the contract notice. Finally, in some circumstances listed in Articles 31 of the Directive 2014/24/EU the contracting authority may recur to the innovation partnership procedure.¹⁹

In particular, on the one hand, open procedures are those award procedures where any interested economic operator may submit a tender in response to a call for competition.²⁰ On the other hand, in the restricted procedures any economic operator may request to participate in response to a call for competition by providing the information for qualitative selection requested by the contracting authority. Only the economic operators invited to do so by the contracting authority - following its assessment of the provided information - may submit a tender.²¹ Although the open and restricted procedures are the general awarding procedures and facilitate the widest participation of the economic operators and the competition, these kind of procedures are not well adapted to the characteristics of the space sector described in the previous paragraphs.²² In fact, in the space field there is a limited number of economic operators capable of interacting directly with public entities and the degree of competition is low; moreover, long-term contracts are common and this aspect expose to the risk of variations and increase in costs during the execution of the contract. In addition, in many

18 Directive 2014/24/EU on public procurement; Directive 2014/25/EU on procurement by entities operating in the water, energy, transport and postal services sectors; Directive 2014/23/EU on the award of concession contracts.

19 See Christopher H. Bovis, “*EU Public Procurement Law (Second Edition)*”, Edward Elgar, UK/ USA, 2012; Albert Sánchez Graells, “*Public Procurement and the EU competition rules (Second Edition)*”, Hart Publishing, Oxford and Portland, Oregon, 2015.

20 See Directive 2014/24/UE, Article 27.21 See Directive 2014/24/UE, Article 28.

21 See Directive 2014/24/UE, Article 28.

22 See Ingo Baumann, Lesley Jane Smith “*Contracting for Space: Contract Practice in the European Space Sector*”, Ashgate Publishing Company, England/USA, 2011; Stephan Hobe, Mahulena Hofmannova, Jan Wouters “*A Coherent European Procurement Law and Policy for the Space Sector*”, LIT Verlag, Berlin, 2011.

contracts, public entities maintain a strategic and leading role and they often take the responsibility for the technological risk, which is not transferred to the private operator.

In light of the above, the most suitable procedures in the space sector are exceptional procedures such as competitive dialogue, negotiated procedure without prior publication of the contract notice as well as the specific procedures and contracts in the field of research and innovation, such as innovation partnership and pre-commercial procurement.

The competitive procedure with negotiation and the competitive dialogue can apply in limited number of situations, such as when the prior negotiations are crucial because of specific circumstances related to the nature, the complexity or the legal and financial make-up of the contract, or when the contracting authority cannot establish technical specifications with a sufficient precision.²³

As provided for in Article 30 of the Directive 2014/24/EU relevant to the competitive dialogue, the contract authorities invite economic operators who have submitted their requirement to participate, with the aim of identifying and defining the means best suited for satisfying their needs. Only those operators invited by the contracting authorities may participate in the dialogue. Once the dialogue is declared concluded by the contracting authority all the identified participants submit their final tenders on the basis of the solution or solutions presented and specified during the dialogue. The contract shall be awarded on the sole basis of the award criterion of the best price-quality ratio.

The Article 29 of the Directive 2014/24/EU describes the competitive procedure with negotiation – similar to restricted procedure – in which any economic operator may submit a request to participate in response to a call for competition where the contracting authorities indicate the minimum requirements to be met by all tenders. Therefore, only those economic operators invited by the contracting authority may submit an initial tender as the basis for the subsequent negotiation to improve its content.

Another type of negotiated procedure is the one without prior publication of a contract notice. In that procedure, contracting authorities do not have to announce upcoming procurement process or hold any form of competition whatsoever, but may contact one or more providers directly. Consequently, because of that peculiarity, this procedure is allowed only in specific cases and circumstances. In particular, according to Article 32 of the Directive 2014/24/EU the negotiated procedure without prior publication may be used for public works, supply and service contracts in any of the following cases: (a) where no tenders or no suitable tenders or no requests to participate or no suitable requests to participate have been submitted in response to an open procedure or a restricted procedure, provided that the initial conditions of the

23 See Article 26 (4) of the Directive 2014/24/EU

contract are not substantially altered and that a report is sent to the Commission where it so requests; (b) for reasons of extreme urgency brought about by events unforeseeable by the contracting authority, the time limits for the open or restricted procedures or competitive procedures with negotiation cannot be complied with; (c) where the works, supplies or services can be supplied only by a particular economic operator when, for instance, there is the need to assure the protection of exclusive rights, including intellectual property rights or when the competition is absent for technical reasons.

The latter circumstance often occurs in the space contracts considering the low degree of competition in some of its sector (e.g. launcher market, sub-orbital flight).

Even though the procedures described above afford greater flexibility compared to the open and restricted ones, the most suitable measures for awarding space contracts are the innovation partnership, the pre-commercial procurement as well as contracts in the field of research and development services.

Procurement for innovation relates to purchasing products or services that do not exist yet, or that need major improvements so they must use research and development to fulfil those features requested by the contracting authorities in the tender procedure.²⁴ Regulated in Article 31 of the Directive 2014/24/EU, innovation partnership is a complex procedure, an original combination of the competitive procedure with negotiation and the competitive dialogue which allows public and private actors to establish partnerships with the supreme purpose of developing an innovative solution that did not exist before.²⁵ Using this procedure, the contract may be awarded to one or more private operators, in successive phases with intermediate targets. It is a single procedure and it involves both R&D activities and the product/service/work thus developed, by concluding a single contract with reference to maximum costs envisaged at the end of the award procedure. As a selection criterion the contracting authorities may use the previous accumulated capacity of candidates in R&D and in innovative solutions.

In addition, in the space sector an important role is played by the contracts for R&D services and the pre-commercial procurement.

24 See Article 2(1)22 and Article 31(1) of the Directive 2014/24/EU and European Commission, “*Guidance on Public Procurement of innovation*”, available at file:///C:/Users/Marina/Downloads/1_EN_autre_document_appui_part1_v5.pdf (accessed 12.09.2018).

25 Dacian C. Dragos, Bianca Racolta, “Comparing legal instrument for R&D&I: State Aid and Public Procurement”, *European Procurement and Public Private Partnership Law Review (EPPPL)*, issue 4/2017.

Pursuant to Article 14 of the Directive 2014/24/EU, “*The Directive shall apply only to public service contracts for research and development services*” which are covered by some codes of the Common Procurement Vocabulary, “*provided that both of the following conditions are fulfilled: (a) the benefits accrue exclusively to the contracting authority for its use in the conduct of its own affairs, and (b) the service provided is wholly remunerated by the contracting authority*”. As a consequence, R&D services other than those listed above are excluded from the scope of the Directive 2014/24/EU. This means that, in general, the contracting authority is not bound to the EU procurement Directives in awarding R&D contracts; however, in any case, the obligation always lies with the contracting authority to respect, all along the procedure, the general principles of transparency, adequate publicity, proportionality, impartiality, and equal treatment. Finally, an approach to procuring R&D services other than those mentioned in Article 14 of the Directive 2014/24/EU is that of pre-commercial procurement. The pre-commercial public procurement was introduced in the European legislative framework with the Commission Communication entitled “*Pre-commercial public procurement: driving innovation to ensure sustainable, high-quality public services in Europe*”.²⁶ Pre-commercial procurement covers the purchase by a contracting authority of R&D services and it concerns the R&D phase before commercialisation. It thus refers to the procurement of long-awaited research results, being a matter of direct public R&D investments, without great involvement in the actual product development phase. More specifically, the following are the key features of pre-commercial procurement:²⁷ (1) the scope is R&D services only; (2) there is the application of risk-benefit sharing; (3) a competitive procurement need to be designed to exclude State aid.

3.3 Other forms of public financing

Another important instrument which public entities may use in order to promote space activities and technological development of national industry is State aid, in the form of direct grants, loans, guarantees, direct investment in the capital of companies (equity or debt intervention) and benefits in kind.²⁸

26 European Commission, “Communication of 14 of December 2007 to the *European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Pre-commercial Procurement: driving innovation to ensure sustainable high quality public services in Europe*”, SEC (2007) 1668, COM/2007/0799 final.

27 Fabrizio Clermont, Francesco Fionda, “A modern approach for procuring research and innovation: the pre-commercial public procurement”, *European Procurement and Public Private Partnership Law Review (EPPPL)*, issue 2/2016, July 2016.

28 See European Commission, “*Commission Notice on the notion of State aid as referred to in Article 107(1) of the Treaty on the Functioning of the European Union*”

In general, State aid is subject to a tight control, as an important part of the EU's competition policy. In fact, according to the European Union law, except for some specific cases, it is illegal for Member States to give financial help to some undertakings and not others in a way that would distort fair competition.²⁹ State aid is defined as an advantage in any form whatsoever conferred on a selective basis to undertakings by national public authorities.³⁰ More precisely, Article 107(1) of the TFEU states that: “*Save as otherwise provided in the Treaties, any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market*”. Therefore, in order to define a measure as State aid, it is necessary to cumulatively fulfil the following conditions: (a) intervention by the State or through State resources; (b) the recipient has an advantage on a selective basis; (c) the measure must distort or threaten to distort competition; (d) it is likely to affect trade between Member States.

Despite the general prohibition of State aid, in some circumstances government interventions is necessary for a well-functioning and equitable economy. Therefore, the Treaty leaves room for a number of policy objectives for which State aid can be considered compatible. Article 107 (2) and (3) of the TFEU contains a number of exemptions under which State aid may be considered acceptable by the Commission such as, for instance: (a) aid to promote the execution of an important project of common European interest; (b) aid to facilitate the development of certain economic activities, where such aid does not adversely affect trading conditions to an extent contrary to the common interest; (c) such other categories of aid as may be specified by decision of the Council. In accordance with Article 108(4) of the Treaty the Commission may adopt regulations relating to those categories of State aid.

In this respect, given the considerable amount of finance needed for R&D projects, the Commission have adopted a favourable view of State aid for R&D since 1996 when the first Framework on the matter was approved.³¹

(2016/C 262/01), available at: [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016XC0719\(05\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016XC0719(05)&from=EN) (accessed 05.09.2018).

29 Philipp Werner, Vincent Verouden, “*EU State Aid Control. Law and Economics*”, Wolters Kluwer, 2016; Conor Quigley, “*European State Aid Law and Policy*”, Hart Publishing, 2015; Alice Pisapia, “*Aiuti di stato. Profili sostanziali e rimedi giurisdizionali*”, CEDAM, Milan, 2013.

30 See Commission Notice already mentioned in reference [30] and http://ec.europa.eu/competition/state_aid/overview/index_en.html

31 European Commission, “*Community framework for state aid for Research and Development*” (1986), available at: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A31996Y0217%2801%29> (accessed 04.09.2018).

The current Framework for State Aid for R&D comprises the EU Regulation No. 651/2014 of 17 June 2014 (General Block exemption Regulation - GBER) and the Communication from the European Commission on the “*Framework for state aid for research, development and innovation, 2014*”.³²

In particular, the GBER exempts some categories of State aid from notification and plays an essential role given that it expands the scope of measures that no longer need to be notified to the Commission for prior approval. R&D is among the exempted areas under certain conditions, so granting State aid for R&D does not fall under the remit of Article 107 of the Treaty when State aid targets non-economic activities. GBER lays down in its section 4 the rules of granting State aid for R&D, emphasising the conditions that must be fulfilled in order to exclude the aid given for R&D from the notification requirement imposed by the Article 108(3) of the Treaty. According to section 4 of the GBER, the following State Aid categories are compatible with the internal market: (a) aid for research and development projects (Article 25); (b) investment aid for research infrastructures (Article 26); (c) aid for innovation clusters (Article 27); (d) innovation aid for SMEs (Article 28); (e) aid for process and organisational innovation (Article 29); (f) aid for research and development in the fishery and aquaculture sector (Article 30).

Finally, apart from State aid, it is worth mentioning venture capital funds, as a new form of financing space activities, which involves also public entities. In fact, in recent years, governments and sovereign wealth funds – often together with private operators - have started to be involved directly as leading investors in start-up space companies.³³ The main purpose of this kind of investments is to provide early stage funding to start-up companies.³⁴

32 European Commission “*Framework for state aid for research, development and innovation*” C(2014)3282, May 2014. Available at: http://ec.europa.eu/competition/state_aid/modernisation/rdi_framework_en.pdf (accessed 12.09.2018).

33 In 2016, Luxembourg opened a fund - SpaceResources.lu - to provide early stage investments in innovative start-ups as well as in more mature companies, with a focus both on Luxembourg-based enterprises in the space resources industry, and companies developing substantial space resources related technologies in the Grand Duchy. In November 2017, the Luxembourg Future Fund (LFF), set up by the European Investment Fund and the Société Nationale de Crédit et d’Investissement, also provided funding to a space start-up.

34 See Bryce Space and Technology (formerly Tauri Group Space and Technology), “*Start-up Space 2018*”, p. 9.

4. Italian legislative framework and the ASI practice

4.1 The Italian legislative framework in the public procurement field

In order to implement the EU 2014 public procurement Directives described above, on 19 April 2016 the Italian Government enacted the Legislative Decree No. 50/2016, the new regulation on domestic public procurement and concessions.³⁵ The enactment of the new regulation had been delegated by the Parliament to the Government with Law n. 11 dated 28 of January 2016. The Italian Government drafted and enacted the new code in less than three months in order to meet the Directives' implementation deadline.

The previous regime of public contracts was set by the repealed Public Procurement Code, Legislative Decree No. 163/2006, and by the implementing regulation contained in the Presidential Decree No. 207/2010. The new Code of Public Contracts has greatly innovated the former framework. In particular, the New Code is divided into six parts:

1. General dispositions (scope of the code, definitions, common principles, excluded contracts, etc.);
2. Public procurement of works, supplies and services, with a focus on: (i) Contracts above and under Community thresholds (Articles 35-36); (ii) Certification of contracting authorities;³⁶ (iii) Awarding process; (iv) Award of the contract (Articles 94-99); (v) Execution of the contract (Articles 100-113-bis); (vi) Particular procurement regimes (Articles 114-163);
3. Concession contracts (Articles 164-178);
4. Public private partnership and general contractor (Articles 179-199);
5. Framework of rules governing infrastructures and preeminent settlements (Articles 200-203);
6. Final and transitional rules (Articles 204-220).

One of the most innovative aspect of the new Code of Public Contracts is that it sets only the broad principles while leaving the detailed regulation to subsequent soft law acts. These acts will be adopted and implemented by the

35 See, *inter alia*, Stefano Fantini, Hadrian Simonetti, "Le basi del diritto dei contratti pubblici", Giuffrè, Milan, 2017; Francesco Caringella, Mariano Protto, "Il codice dei contratti pubblici dopo il correttivo", Dike Giuridica, Rome, 2017; Michele Corradino, Saverio Sticchi Damiani, "I nuovi appalti pubblici. Commento al d.lgs. 18 aprile 2016 n. 50", Giuffrè, Milan, 2017; Rosanna De Nictolis, "I nuovi appalti pubblici. Appalti e concessioni dopo il d.lgs. 56/2017", Zanichelli, Bologna, 2017.

36 In order to reduce the number of entities capable of conducting a bid procedure, allowing only those having certain qualifications and/or experience to autonomously carry out award procedures. See Articles 37-43 of the new Public Contract Code.

competent authorities, such as for instance the National Anti-corruption Authority (ANAC), the President of the Council of Ministers, the Ministry of Infrastructure and Transport and other Ministries (such as the Ministry of Economy and Finance, the Ministry of Economic Development, etc.). Such an approach should ensure the capability of the regulators to adapt quickly and to respond effectively to the needs rising from market developments.

The Italian Code of Public Contracts reflects in the national law the main principles and rules set forth in the EU 2014 Directives and partially mentioned above in paragraph 3.2. However, in compliance with the principle of avoiding gold plating (i. e. the prohibition of the introduction of unnecessary requirements or procedures during the transposition of a directive), the Italian legislator introduced some specific rules in order to protect particular interests and pursue specific objectives such as transparency, corruption prevention, fight against Mafia as well as safeguard of the social and environmental values.

4.2 ASI main types of contracts and forms of financing space programmes

The Italian Space Agency (ASI), established by the Law No. 186/1988, is the national space agency, having the legal nature of a public research institution, entrusted with the execution and implementation of space programs and projects on the basis of Government's guidelines. As a public entity, ASI is bound to various national and European rules in carrying out and financing space activities. However, as already highlighted in the previous paragraphs, given the peculiarities of the space sector, the most suitable and used instruments are those provided for in exceptional rules, while fully respecting the general principles of transparency, impartiality, competition, etc.

This is the case, for instance, for some types of contracts and State aid in the field of R&D projects. Among the main forms of funding used by ASI to carry out space programs we may quote R&D services contracts awarded pursuant to Article 158 of the Legislative Decree No. 50/2016. This legislative provision reflects in the national law the principles provided for in Article 14 of the Directive 2014/24/EU and states that the new Public Contract Code shall only apply to public service contracts for R&D services when both of the following conditions are fulfilled: (a) the benefits accrue exclusively to the contracting authority for its use in the conduct of its own affairs, and (b) the service provided is wholly remunerated by the contracting authority. If any of the conditions set out in Article 158 are not met, the contract is excluded from the scope of Public Contract Code but, in any event, the main principles of the TFEU, fixed also in Articles 4 of the Legislative Decree No. 50/2016, must be observed. In this respect, the Italian Space Agency usually adopts a two-stage procedure: (i) on a preliminary basis, a call for expression of interest is published in order to pre-qualify

operators holding the needed requirements; (ii) consequently, only the operators having passed the first step, will receive a request for tender.³⁷

Furthermore, as already described above, new procedures like Innovation Partnership have been introduced by the EU public procurement Directives and transposed in the Legislative Decree No. 50/2016, with the aim of allowing public entities more flexibility in awarding contracts for innovative solutions. In this respect, ASI has recently applied the Innovation Partnership procedure for the project “ItalGovSatCom” whose goals are to promote the research and development of satellite communications, to implement an innovative satellite system as well as to provide advanced telecommunication services.

Additional exceptional instruments available to ASI for awarding public contracts are those provided for in Article 16 of the Legislative Decree No. 50/2016 and in Articles 159-162 of the Legislative Decree No. 50/2016. In particular, on the one hand, considering that space programs are often carried out on an international cooperation base, Article 16 of the Legislative Decree No. 50/2016, adopted on the basis of the Article 9 of the Directive 2014/24/EU, is particularly relevant since it states that the provisions of the Public Contracts Code shall not apply when public procurements or concessions are awarded on the basis of the procurement procedures laid down in international agreements or by international organizations.

On the other hand, given the dual-use nature of many space technologies, ASI may use - where appropriate - the specific procedure for contracts awarded in the field of security and defence, set forth in Article 162 of the Legislative Decree No. 50/2016, that reflects in the national law the principles provided for in Article 15 of the Directive 2014/24/EU. According to these provisions, contracts are awarded by implementing a negotiate procedure with at least five economic operators, provided that the needs of security and confidential nature of the contract are preserved.

Apart from public contracts, ASI has at its disposal other instruments to finance space projects including, for instance, State aid, especially in the field of R&D projects, in compliance with the EU Regulation No. 651/2014. In this respect, in order to identify the recipients of the aid and ensure a wide participation, the Italian Space Agency has often published open calls directed to all operators with reference to different strategic areas, such as biomedicine, astrobiology, Earth Observation, key enabling technologies.³⁸

37 An example of a procedure pursuant to Article 158 is the project named “UAS/RPAS”. In this case, the procedure issued on February 2018 and still in progress, was applied because the results of the contract will be made available to the Italian Civil Aviation Authority under the terms of an agreement between ASI and the national aviation authorities (<https://www.asi.it/it/agenzia/bandi/gare-e-appalti/avviso-indagine-di-mercato-attivita-industriali-relative-alla-uasrpas>).

38 One of this procedure, issued on December 2017 and still in progress, is related to the project named “*Key enabling technologies*” whose main aim is to finance innovative

In addition to the ones listed above, ASI may resort to other instruments to fund space activities, such as those provide for in Article 4 of its Statute,³⁹ according to which the Italian Space Agency may: (i) Establish or hold stakes of companies, consortium and other organizations together with public and private entities;⁴⁰ and (ii) Under some specific conditions, own innovative financing instruments and risk-capital participation.

Finally, it is worth to mention that ASI carries out many space activities in the context of European Union projects and allocates a substantial part of its budget to space programmes carried out within international organizations such as the European Space Agency or in cooperation with other Space Agencies, often under intergovernmental agreements concluded by Italy with other States. Considering the high investments involved, the technological skills and know-how required and the geopolitical importance of many space projects, it is not unusual that space programs are developed and implemented within the framework of international organizations or in cooperation between different Countries.

5. Conclusions

As can be drawn from the preceding paragraphs, due to the characteristics and peculiarities of the space sector, States continue to play a crucial role in financing space programmes, despite the increasing number of private operators involved. States have several financing instruments to implement their space projects and thanks to an appropriate use of the different forms of financing described above (Paragraphs 3 and 4), States are fundamental for the development of the space sector as a whole. In fact, State intervention can promote and guide the technological progress, foster competition between companies and contribute to increase their competitiveness in the international arena.

Therefore, the analysed forms of public financing play a key role for the economy of a Country and are an industrial policy tool of the utmost importance. In general, these instruments place contracting authorities in a position to drive demand for innovation and to have a clear impact upon the technological, industrial and services' innovations. Public choices may act as

R&D enabling projects for the space sector (<https://www.asi.it/it/agenzia/bandi/bandi-scientifici-e-tecnologici/bando-di-finanziamento-progetti-di-ricerca-industriale>).

39 The ASI Statute was approved under the Law Decree No. 213/2009 and entered into force on 1st May 2011, as amended, https://www.asi.it/sites/default/files/attach/dettaglio/138_-_aggiornamento_statuto_-_allegato_modificato.pdf

40 e-GEOS, which is considered a leading international player in the Earth Observation and Geo-Spatial Information business, is an example of company established by ASI together with a private entity. Further examples of companies in which ASI holds stakes are CIRA S.C.p.A., ALTEC S.p.A., SPACELAB S.p.A. as well as the "E. Amaldi" Foundation.

a beneficial lever for innovation and industrial development, by means of the involvement of the national industries in space programmes.

As already mentioned above, public procurement and State aid are strictly regulated by international regulations as well as national rules and procedures. The regulations are based on the general principles of transparency, adequate publicity, proportionality, impartiality, and equal treatment precisely for ensuring the widest possible participation of economic operators and choosing the best contractor. The analysis of the different procurement procedures, however, has shown that although the normal award procedures (open and restricted) facilitate the widest participation of the economic operators and the competition, these kind of procedures are not well adapted to the characteristics of the space sector. On the contrary, the most suitable and used procedures in the space sector are exceptional procedures such as negotiated procedure without prior publication of the contract notice as well as the specific procedures and contracts in the field of research and innovation, such as innovation partnership and R&D services contracts.

Despite the greater flexibility of the latter procedures, they not always meet the specific needs of the space projects in their practical implementation. For these reasons, a wide reflection at European and national level would be desirable in order to consider the possibility to adopt a specific legislation for procurement in the space sector, in order to clear the way for certain exemptions from general rules. Finally, it is worthy of mention that new forms of public financing of space activities are raising in recent years: this is the case, for instance, of venture capital funds, innovative financing instruments as well as the establishment and the acquisition of shareholdings in private companies.