



Department of Political Science
Politics: Philosophy and Economics

Chair of Contemporary History

**From Inception to Global Presence:
The Italian Space Agency's Journey**

Supervisor

Prof. Jean-Pierre Darnis

Candidate

Sofia Di Genova 100722

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TABLE OF CONTENTS

INTRODUCTION	1
FIRST CHAPTER: Creation and history of the Italian Space Agency (ASI)	4
1.1 <i>Historical context of Italian space history</i>	4
1.2 <i>Space system preceding the Italian Space Agency (ASI)</i>	6
1.3 <i>Why the Italian Space Agency (ASI) was created and why so late</i>	9
SECOND CHAPTER: Evolution of the Italian Space Agency (ASI)	13
2.1 <i>Budget and governance</i>	13
2.2 <i>Perception and relationship with political and institutional framework</i>	16
2.3 <i>Italian Space Agency's (ASI) transfer to the new headquarters in Tor Vergata and related issues</i>	18
THIRD CHAPTER: The Italian Space Agency (ASI) as tool for European and international policies .	22
3.1 <i>Cooperation with the European Space Agency (ESA)</i>	22
3.2 <i>Evolution of the Ministerial Councils of the European Space Agency (ESA)</i>	23
3.3 <i>Cooperation with the National Aeronautics and Space Administration (NASA)</i>	25
FOURTH CHAPTER: The role of the Italian Space Agency (ASI) in the current space context	28
4.1 <i>Creation of a Prime Minister's Space Steering Committee</i>	28
4.2 <i>Priority given to space: the growth of Italian space budgets</i>	30
4.3 <i>Is the Italian Space Agency (ASI) keeping up with this growth?</i>	33
CONCLUSION	37
BIBLIOGRAPHY	41

INTRODUCTION

Established in 1988 as a cornerstone of Italy's space endeavours, the Italian Space Agency (ASI) has significantly advanced the nation's capabilities in space exploration and policy, positioning Italy as a key player in European and international space initiatives.

The Italian Space Agency (ASI) has demonstrated its pivotal role as an institution in the advancement of space exploration and technology, both within the European and international frameworks.

I have chosen to undertake an in-depth exploration of this subject matter, driven by a longstanding fascination with the aerospace domain. In my quest for a research topic, I sought one that would not only stimulate but also captivate me throughout the thesis writing process. By studying the Italian Space Agency (ASI), I have had the chance to explore the Italian government's policies, funding mechanisms, and the dynamics behind international collaborations.

This thesis delves into the magnificent Italian space history, the creation, and the evolution of the Italian Space Agency (ASI), highlighting its significant contributions to European and international policies. The establishment of this entity marked a milestone in Italy, building on the legacy of the National Research Council (CNR), which was initially instrumental in Italy's space endeavours. The Italian Space Agency (ASI) was subsequently designed to enhance the country's capabilities in the sector and manage several high-profile projects and collaborations.

Answers will be provided on the reasons why the agency was created this late, elucidating the urgent need to consolidate Italy's space policy strategies, unify space programmes, and promote technological advancements within the aerospace industry.

Furthermore, this thesis delineates the inception and evolution of the National Space Plan (PSN), which encountered financial difficulties in the early 1990s, leading soon after to a managerial crisis and temporary suspension. The emphasis is then placed on the agency's organisational structure and its internal governance, showing its relation to the National Recovery and Resilience Plan (PNRR).

Moreover, it is crucial to mention the establishment of the Italian Space Agency (ASI) in the new headquarters in Rome and its related issues, outlining the allegations against Enrico Saggese, former president of the agency, who was investigated for corruption.

Another pillar of the Italian Space Agency (ASI) is its long-lasting involvement with the European Space Agency (ESA), to which the agency is one of the largest contributors, playing a crucial role in both mandatory and optional programmes.

Beyond Europe, Italy has managed to forge partnerships with international agencies, such as the National Aeronautics and Space Administration (NASA), collaboration that has eased the sharing of knowledge and resources and has located the Italian Space Agency (ASI) as a central player in the global context. Thanks to joint projects, Italy and the United States of America have contributed to revolutionary missions and technological innovations that have fostered human understanding of space.

A focal point within this thesis revolves around the establishment of the Prime Minister's Space Steering Committee, which emerged in response to the promising growth of the Italian space economy. This body aims to coordinate the country's space activities under the Presidency of the Council of Ministers. It reflects a strategic measure taken to be able to compete at the international level, and it underscores the necessity for unity in facing new challenges in the space sector. Furthermore, the Space Steering Committee monitors and implements the directives coming from the National Recovery and Resilience Plan (PNRR), with a focus on promoting coordination among stakeholders.

In addition, this thesis examines Italy's participation in the programmes of the European Space Agency (ESA), highlighting its varying levels of financial contributions over the years. It displays the Italian commitment to advance space exploration in the European framework, carefully investigating its position in the European Space Agency's (ESA) Ministerial Council meetings and its evolving position as a significant contributor to the agency's budget.

Lastly, it assesses the current status of the Italian space industry, focusing on investments within the groundwork of the National Recovery and Resilience Plan (PNRR). It points out the transformation of the aerospace sector, remarking the increasing involvement of private actors alongside traditional state entities. Additionally, in this new and innovative

framework, the importance of collaboration between the public and private sectors is emphasised in driving the growth and competitiveness of the Italian space economy.

The purpose of this thesis is to elucidate the historical context surrounding the establishment of the Italian Space Agency (ASI) and its subsequent evolution. By tracing the agency's origins and the system preceding it, the thesis seeks to provide a nuanced understanding of Italy's role in space exploration.

Moreover, the thesis aims to analyse the organisational structure, the governance's dynamics, and the strategic objectives of the Italian Space Agency (ASI). It endeavours to assess the agency's effectiveness within the aerospace sector.

Additionally, the thesis examines in detail the Italian participation and contribution to European and international space activities. It aspires to determine the country's impact at the global level and its strategic partnerships.

The thesis endeavours to conduct a rigorous examination of the contemporary issues and challenges, such as budget allocations, organisational and managerial controversies, encountered by the agency in recent years.

Overall, the thesis intends to provide a comprehensive analysis of the Italian Space Agency's (ASI) role within the global space community, and the consequent implications for national policies.

FIRST CHAPTER: Creation and history of the Italian Space Agency (ASI)

1.1 Historical context of Italian space history

The narrative of space exploration has traditionally been dominated by the two global powers: the United States of America and Russia. Mainly, Konstantin Ciolkovskij (Russia, 1857–1935) and Robert Goddard (USA, 1882–1945) were the pioneers of astronautic science.

Nevertheless, Italy has always been at the forefront of the exploration of outer space, resulting in a niche of excellence emerging in this high-level sector, operating in a closed circle of researchers and experts.

The first real contribution to space exploration was published in 1914 by Giulio Costanzi in his analysis of energy sources, considering the physical and medical challenges that future astronauts will encounter, such as temperature, radiation, acceleration, and ultimately, weightlessness.

Coming next, Luigi Gussalli with innovative intuitions, including his book in 1923, “Is it possible to attempt a journey from earth to the moon?”, with his hypothesis on the first usage of solar energy as a power source for space travel.

Gaetano Crocco, a physician, studied the “gravitational slingshot”, a mechanism for accelerating space probes by harnessing the gravity of planets passing by, enabling them to reach speeds and distances otherwise unthinkable. In his 1956 article “One-Year Circuit Earth-Mars-Venus-Earth”, he proposed an exceptional trajectory that the National Aeronautics Space Administration (NASA) still refers to as the “Crocco Grand Tour”.

Starting in the 1960s, a significant push was led by the physicist Edoardo Amaldi, who was one of the founders of the European Space Agency (ESA).

Certainly, Luigi Broglio can be regarded as the pioneer of Italian astronautics. Outstanding engineer who succeeded in involving Italy in a space collaboration with the United States of America, thus the National Aeronautics Space Administration (NASA). As a result of Broglio’s hard work, the San Marco Project emerged on December 15, 1964, from the Wallops Island launch site in Virginia, becoming the first Italian satellite and positioning

his country as the third in the world to launch a satellite with a national team, following the Soviet Union and the United States of America.

The Luigi Broglio Space Centre is the only Italian-owned space base that is located outside national territory, specifically in Kenya, overlooking the Indian Ocean. This launch platform was used for various launches between the 1960s and 1980s and has since been involved in orbit object tracking.

All of this was possible thanks to the birth of the city of Guidonia, founded in Rome in honour of Alessandro Guidoni, an Air Force general who died while testing a new parachute. An impressive body with laboratories and sophisticated flight simulation systems began to develop in Guidonia. Facilities that did not even exist in the United States, and since then, Italian space research has been unstoppable.

At the beginning of the 1960s, Italy also established the Commission for Space Research (COSPAR) under the National Research Council (CNR), in order to promote scientific research in space at the international level.

In 1980, the Minister for Scientific Research in the Cossiga I government, Vito Scalia, identified, in his report to parliament, several crucial issues of the institutional governance system in the space sector. Scalia, for instance, noticed that the delegation to the Ministry of Research portfolio resulted in a less efficient linkage between the different activities and that the sector has the privilege, in relation to others, of finding its own reason for existence on the one hand in the economic value of its technological fallout, and on the other hand in its universal and political character, to the extent that it touches on the various interests of countries such as defence, domestic and foreign policy, economics, technology, science, culture, and social issues ¹.

That is the reason why, in 1988, the Italian Space Agency (ASI) was finally established, becoming, in this way, the focal point of Italy's space endeavours. It was thought of as an

¹ Fazioli Giovanni, *Il decollo dell'industria spaziale italiana. Storia ed evoluzione di un successo non raccontato*, Torino 2020, pp. 9.

entity capable of coordinating the entire space sector in an innovative manner, possessing greater autonomy compared to, for instance, the National Research Council (CNR).

The 1990s represent the turning point for the Italian space sector, reorganising at the industrial and institutional level with major ministerial support, capable of consolidating fragmented territorial interests into a unified industrial entity spread across the peninsula. The creation of the Italian Space Agency (ASI) granted the promotion of research and development both at a local and global level, coming from a single voice.

Furthermore, in this period, it began the construction of the International Space Station (ISS), and Italy played a significant role in the production of this permanent outpost for humans in space. A rigorous selection process led to the choice of the biophysicist Franco Malerba as first astronaut, followed by Umberto Guidoni, Maurizio Cheli, Roberto Vittori, Paolo Nespoli, and Luca Parmitano. Soon after, Samantha Cristoforetti, in 2014, made history as the first Italian woman in space.

Umberto Guidoni in 2001 became the first European astronaut to visit the International Space Station, followed by Roberto Vittori after having completed his training in Russia, near Moscow, to become a cosmonaut. Paolo Nespoli brought the entirely Italian-built Node 2 to the International Space Station.

From 1998 (when the first ISS module was launched) to 2010 (when the ISS was completed with Leonardo), over forty flights accomplished the largest aerospace engineering feat ever. The International Space Station was later visited by Luca Parmitano and Samantha Cristoforetti, Italian ambassadors in space, demonstrating the pivotal role played by Italy in advancing space exploration.

1.2 Space system preceding the Italian Space Agency (ASI)

The National Research Council (CNR) is the largest national research body in Italy and the only one under the Research Ministry performing a wide range of scientific activities. The main aim of the National Research Council (CNR) is the promotion of scientific and technological progress in Italy.

Established for the first time in 1923, it was designed to implement research and boost innovation and competitiveness at the international level, improving the national industrial sector. The National Research Council (CNR) represented Italy at the International Research Council in Brussels, and it acquired legal status only in 1945.

The National Research Council (CNR) collected its knowledge from people by virtue of their competences, experiences, ideas, opinions, and perceptions. A valuable contribution is given by its technologists, and researchers, as well as by its young postgraduate researchers from universities that assist and support the National Research Council's projects.

The activity of this research entity is accomplished in all its 107 institutes placed throughout Italy, in order to obtain importance both at the local and international level. Accordingly, the National Research Council (CNR) performs within the scope of European cooperation and integration, working together with university research bodies and other public and private organisations.

Moreover, the National Research Council (CNR) directs and coordinates national and international research programmes, as well as supporting scientific activities and research of significant interest to the national system. It provides, upon request from governmental authorities, specific expertise for national participation in international scientific organisations or intergovernmental programmes. [...] It manages the enhancement, pre-competitive development, and technology transfer of research results conducted by its own scientific network and by consortia, foundations, companies, or centres established or participated in by the organization. It conducts, also through its own scholarship and research allocation programmes, training activities in university doctoral research courses, in implementation of Article 4, paragraph 4, of Law No. 210 of July 3, 1998, high-level postgraduate training, and continuous and recurrent lifelong learning activities. It may also carry out non-university higher education training activities ².

² *Consiglio Nazionale delle Ricerche* – CNR, Ministero dell'Università e della Ricerca, <<https://www.mur.gov.it/it/aree-tematiche/ricerca/il-sistema-della-ricerca/enti-di-ricerca-pubblici/consiglio-nazionale-delle-ricerche>>

A Space Research Commission (CRS) of the National Research Council (CNR) was established in 1959, in order to study the atmosphere beyond 100 km, also for meteorological purposes.

Luigi Broglio, with the Space Research Commission (CRS), was in charge of representing Italy at the European level, sponsoring the country in the field of space exploration in meetings that, for instance, led to the founding of the European Space Research Organisation (ESRO) in 1962 and of the European Launcher Development Organisation (ELDO) the next year ³.

The establishment of a floating launch base off the coast of Kenya and the launch of the first Italian satellite in 1964 happened as a result of an idea matured between the President of the National Research Council (CNR), Giovanni Polvani, and Luigi Broglio. Afterwards, on behalf of the National Research Council (CNR), SIRIO, an entirely Italian satellite, was developed and launched in 1974.

Since the mid-1970s, funding has always been allocated within multi-year programmes, with final projects being settled by the National Research Council (CNR), usually in collaboration with private entities. Subsequently, these projects began to be endorsed by the Interministerial Committee for Economic Planning (CIPE).

The Presidency of the Council of Ministers took under its control the National Research Council (CNR) in 1979, and consequently, it fell under the guidance of the Minister for the Coordination of Scientific Research.

In the same year, the National Research Council (CNR) was entrusted with overseeing Italian participation in the European Space Agency (ESA). However, the National Space Plan (PSN) arose due to the Interministerial Committee for Economic Planning's (CIPE) disappointment with the low industrial return on Italy's contribution to the European Space Agency (ESA).

The enactment of Law 46/82 implicitly reflected the government and parliament's discontent with the National Research Council's (CNR) performance, and it was incriminated

³ Michelangelo De Maria, Lucia Orlando, Filippo Pigliacelli, *Italy in Space 1946-1988*, ESA Publications Division, Noordwijk 2003, pp. 5-6.

as being responsible for Italy's inadequate scientific and technological performance since the post-World War II era ⁴.

Therefore, in 1985, Minister Granelli proposes a project for establishing an entity completely dedicated to the space sector. This new space agency was intended to operate as an independent body from the National Research Council (CNR) and feature an innovative administrative structure ⁵.

Consequently, in 1989, the National Research Council (CNR) was placed under the direction of the Ministry for University and Scientific and Technological Research while still maintaining its financial and organisational autonomy. The establishment of the Ministry for University and Scientific and Technological Research had a significant impact, given that, until that moment, the National Research Council (CNR) was the primary decision-making centre for Italian research policy.

1.3 Why the Italian Space Agency (ASI) was created and why so late

As previously mentioned, the first draft bill for the establishment of a new space agency was presented in 1985, however, the Italian Space Agency (ASI) was officially founded on May 30, 1988, through a legislative decree (No. 186) replacing the role that the National Research Council (CNR) had in the space sector.

The Italian Space Agency (ASI) was handed over the authority to centralise all Italian endeavours in the field of space exploration, and in doing so, it has become a central hub for a large industrial and scientific community.

It is a national public institution responsible for conceptualising and executing several astronomical projects in partnership with other space agencies from all over the globe, while consistently adhering to government guidelines.

⁴ Matteo Landoni, *Lo sviluppo dell'industria spaziale italiana, Coevoluzione di imprese e istituzioni nazionali dello spazio, 1969-2007*, Università degli Studi di Milano, pp. 25.

⁵ *Ivi*, pp. 33.

The Agency has emerged as a pivotal player in the field of space science, assuming a prominent position both regionally, within Europe, and globally, for instance, through its notable collaboration with NASA.

The first task given to the Italian Space Agency (ASI), dealt with the draft of a multi-year development programme aimed at laying the groundwork for sectoral expansion at the international level.

The primary motivation that led to the establishment of the Italian Space Agency (ASI) stemmed from the urgency to consolidate and concentrate Italian space policy strategies in the institutional domain. Therefore, there arose the need to unify space programmes from an organisational standpoint, disentangling them from both the National Research Council (CNR) and the Ministry of Scientific Research. The Agency's purpose extended beyond that of a traditional research centre merely focused on "pure science"; rather, it was conceived as a catalyst for enhancing Italian industrial competitiveness, concurrently aiming at fostering innovation.

Indeed, «the Italian Space Agency must manage public investments with the main purpose of promoting the technological capabilities of our aerospace and electronic industry, directing specific projects aimed at achieving high-level technological and risky international interests»⁶.

From Minister Luigi Granelli's deliberations emerges a preeminent motivation for the establishment of the Italian Space Agency (ASI), namely, support for the aerospace industry as a component of a broader strategy. Thus, the aim was to provide the country's system with tools to align with the highest global technological standards. The Agency's function was that of simplifying connections with European partners and coordinating national and international programmes, rather than performing solely as a research centre.

The agency initiated operations with the aim of fulfilling its proposed role, which was concluded nearly a decade earlier with the initial space plan. This role primarily involved preparing and managing the plan itself, a responsibility that had previously been temporarily assigned to the National Research Council (CNR).

⁶ Rita Batosti, *Il sito dedicato a LUIGI GRANELLI, scritti scelti*, Kanso, pp. 50.

Alongside its principal functions, the Italian Space Agency (ASI) assumed control over structures and programmes once conducted by the National Research Council (CNR). The rationale behind introducing a brand-new innovative administrative framework into the Italian system, derives from the urgency to establish a versatile organisation with efficient processes, which were lacking in the previous years.

Originally, the institution of the Italian Space Agency (ASI) was demonstrated to be laborious to manage from a political standpoint, as it sparked considerable parliamentary debate. It appears that prior to the first draft bill in 1985, there was no apparent urgency for a unified entity tasked with handling and promoting the technological capabilities of the Italian space industry.

The government proposed an agency that would oversee and coordinate scientific and technical programmes for the exploration and peaceful usage of space from both an economic and industrial perspective.

Simultaneously, the Ministry for the Coordination of Scientific and Technological Research was charged with acting as a supervisory authority, while the Interministerial Committee for Economic Planning (CIPE) would define a general plan for political reference. A political debate occurred with the Italian Communist Party (PCI), which claimed that the agency should be subject to public law, although they agreed and advocated for a structure of moderate size with high technical and managerial expertise.

Fortunately, the timelines were sped up by the prospects of international collaborations, with particular emphasis placed on the European Space Agency's (ESA) conference in Italy in January 1985.

Minister Granelli deemed it urgent to secure a new long-term programme with the European Space Agency (ESA); thus, a financial effort was indispensable.

The European collaboration programmes launched at the Hague were regarded as «significant opportunities for collaboration, scientific and technological advancement, industrial progress, and influence in Europe in the field of technological relations»⁷.

⁷ Matteo Landoni, *Lo sviluppo dell'industria spaziale italiana, Coevoluzione di imprese e istituzioni nazionali dello spazio, 1969-2007*, Università degli Studi di Milano, pp. 39

It was necessary to set in motion sufficient national commitments on both the financial front and the internal organisation of public management structures, in the interest of capitalising on these opportunities offered to the Italian industrial system and securing positions in this high-technology sector.

Minister Granelli, thus, leveraged the aforementioned situation to move forward with the formation of the Italian Space Agency (ASI).

SECOND CHAPTER: Evolution of the Italian Space Agency (ASI)

2.1 Budget and governance

The National Space Plan (PSN) was launched for the first time in 1990, two years after the foundation of the Italian Space Agency, and it lasted for the following five years. It focused on four main objectives: increasing financial investments; industrial employment, basic scientific research; and training policies in the “mezzogiorno” (Italian southern regions)⁸.

Several considerations in the National Space Plan (PSN) evaluated the significance of advanced technologies to ensure the economic competitiveness of industrialised countries, thus providing justification for public investment in programmes centred around high space technologies. For instance, for what it concerns the telecommunications sector, it was estimated that public investments in space research would produce economic returns twenty times higher.

The Interministerial Committee for Economic Planning (CIPE) initially authorised an amount of 4,900 billion lire for the four-year period. However, soon after the sum was reduced by the financial law to 3,122 billion lire, to which 42 billions of residual funds were supplemented⁹.

Nevertheless, challenges arose in implementing the plan from the year 1992 onwards. This was prompted by the Board of Directors of the Italian Space Agency (ASI), expressing their necessity to revise the three-year contribution foreseen by the financial law. This adjustment aimed at ensuring the commitments undertaken at the conference of the European Space Agency (ESA) in Munich at the end of 1991, taking into consideration the effect of the devaluation of the lira.

⁸ Matteo Landoni, *Lo sviluppo dell'industria spaziale italiana, coevoluzione di imprese e istituzioni nazionali dello spazio, 1969-2007*, pp. 63.

⁹ Archivio Agenzia Spaziale Italiana, *Bilancio di previsione 1993, considerazioni*, Agenzia Spaziale Italiana, pp. 2.

Due to recourse to a multi-year amortisable loan, the Italian Space Agency (ASI) was able to start its new programmes for the period 1993-1995 without compromising ongoing projects.

Initially, in 1993, lacking credit, the Italian Space Agency (ASI) would not have been able to meet its expenditure obligations, amounting to 830 billion lire, far exceeding the allocation provided in the budget ¹⁰. Moreover, financial difficulties and ensuing managerial crisis faced by the Italian Space Agency (ASI) in the early 1990s, resulted in a drastic deceleration in space activities and the temporary suspension of the Space Plan.

Subsequently, the plan was scaled down and received approval at the end of 1997 when the Interministerial Committee for Economic Planning (CIPE) endorsed the 1998-2002 plan.

After the first five years of the Italian Space Agency's (ASI) activities, a programme of "urgent measures to restore the Agency" was implemented with Law No. 233 in May 1995, announcing the dissolution of the Board of Directors and placing the Agency under the management and supervision of a special commissioner.

The Ministry of University and Scientific and Technological Research (MIUR) appointed this special administrator for the economic and financial restructuring of the Agency, who was supported by a commission of nine experts responsible for advising on the allocation of funds for scientific research.

Meanwhile, a second commission of five experts would evaluate the industrial activity carried out by the Italian Space Agency (ASI) in order to prepare the subsequent five-year plan.

This second committee established, on one hand, a body for strategic direction specialised in space policy, the Interministerial Space Committee; and on the other hand, appointed a Director of Scientific Programmes and a Director of Industrial Programmes, with managerial and operational responsibilities.

¹⁰ Matteo Landoni, *Lo sviluppo dell'industria spaziale italiana, coevoluzione di imprese e istituzioni nazionali dello spazio, 1969-2007*, pp. 67.

A stability was only reached in 1999 when a coordination research programme was approved for the entire aerospace sector and when greater autonomy was granted in order to provide services for third parties.

The National Space Plan (PSN) presented by the Italian Space Agency (ASI) for the period 2003-2005 called upon the agency itself to promote any initiative in the aerospace field and, naturally, to enhance the competitiveness and internationalisation of the Italian industry.

Likewise, for the period 2006-2008, the National Space Plan (PSN) restates the necessity to strengthen the country's scientific research, internationalisation, and human capital enhancement. Moreover, they emphasised the need of collaboration with Europe and boosting the technological level of the Italian aerospace industry, and consequently, its competitiveness. The total amount allocated for various sectors approximates to €235 million¹¹.

In the following years, the Italian government established to further reduce the annual budget from €600 million to €570 million for the triennial 2010-2012, and then downsized it again to €503 million per year in 2011¹². This decision was met with the opposition of the Italian Space Agency (ASI), which encountered challenges in implementing the strategy outlined at the beginning of the triennial.

The Ministry of University and Research (MIUR) also decreased the budget to €478 million annually for the period 2013-2015¹³. Meanwhile, in the subsequent five years, the budget of the Italian Space Agency (ASI) will reach €1.1 billion annually¹⁴, with a record budget for the triennial 2022-2024 of approximately €1.8 billion per year.¹⁵

¹¹ *Piano AeroSpaziale Nazionale 2006-2008*, Agenzia Spaziale Italiana, pp. 14.

¹² *Piano Triennale delle Attività 2010-2012*, Agenzia Spaziale Italiana, pp. 58-63.

¹³ *Piano Triennale di Attività 2013-2015*, Agenzia Spaziale Italiana, 2012, pp. 5.

¹⁴ *Agenzia Spaziale Italiana, Piano Triennale delle Attività – Anni 2018-2020*, Agenzia Spaziale Italiana, 2018, pp. 39.

¹⁵ Andrea Zanini, *Finanziamenti, competenze e interesse nazionale: i pilastri del Made in Italy spaziale del 2023*, Aspenia online, 2023, <<https://aspeniaonline.it/finanziamenti-competenze-e-interesse-nazionale-i-pilastri-del-made-in-italy-spaziale-del-2023/>>

2.2 Perception and relationship with political and institutional framework

As seen in the previous chapter, the Italian Space Agency (ASI) was established with Law No. 186 on May 30, 1988, and took over the management of the National Space Plan (PSN) from the National Research Council (CNR) ¹⁶.

Consequently, starting from this law, the Agency was placed in charge of implementing space programmes harmonised within a European and global framework. Additionally, it was tasked with developing scientific programmes to enhance the competitiveness of the national space industry, based on directives issued by the Ministry of Education, University, and Scientific and Technological Research (MIUR), according to the criteria established by the Interministerial Committee for Economic Planning (CIPE).

Starting in 1993, after various administrative and judicial events, the management of the Italian Space Agency (ASI), by Law No. 233 of May 31, 1995, entrusted both ordinary and extraordinary administration to a sole administrator ¹⁷.

With an initial reorganisation of the agency, Legislative Decree No. 27, in January 1999, and more significantly with another one, Legislative Decree No. 128, in June 2003 ¹⁸, it is stated the "delegation for the reform of the organisation of the Government and the Presidency of the Council of Ministers, as well as public entities" ¹⁹.

It is, therefore, a reorganisation and reform of research entities under the supervision of the Ministry of Education, University, and Research (MIUR), and "was aimed at promoting, developing, and disseminating applied research in the space and aerospace sector by enhancing Italian presence in international forums, in line with the guidelines of the EU's Sixth Framework Programme for Research and Development, and incorporated into the

¹⁶ La legge è stata abrogata ai sensi dell'art. 10 del D.Lgs. 27/99 di riordino dell'ASI, a decorrere dall'entrata in vigore dello stesso decreto legislativo.

¹⁷ La legge è stata abrogata ai sensi dell'art. 10 del D.Lgs. 27/99 di riordino dell'ASI, a decorrere dall'entrata in vigore dello stesso decreto legislativo.

¹⁸ D.Lgs n. 128/03 recante "Riordino dell'Agenzia spaziale italiana (A.S.I.)".

¹⁹ *Riordino dell'Agenzia Spaziale Italiana (ASI)*, Camera.

<http://leg15.camera.it/cartellecomuni/leg14/RapportoAttivitaCommissioni/testi/10/10_cap21_sch01.htm>

Government's scientific and technological policy guidelines, approved by CIPE on April 19, 2002"²⁰.

To achieve the objective of Legislative Decree 128/03, the organisational structure of the Italian Space Agency (ASI) had to be adapted to the European context, thereby promoting integration into European and international research networks and equipping it with homogeneous structures to meet managerial functions and reserve activity plans for the scientific component.

Among the articles of the reorganisation, it is highlighted that one of the agency's activities is to prepare and implement the National Space Plan (PSN) based on the National Research Programme (PNR) and the government's guidelines in this matter²¹.

Additionally, the agency's activities include participating in the work of the Council of the European Space Agency (ESA), signing international agreements for aerospace programmes, and integrating public and private research both nationally and internationally. The defining element of the structure of the agency is the organisational units, which carry out their research activities based on the Three-Year Activity Plans. The proposals are formulated by the President of the Agency and submitted to the Board of Directors, which then approves the plan with the support of a Scientific Council. The National Space Plan, which has a duration of three years, must be developed based on the National Research Programme (PNR) and the government's guidelines according to Article 3, paragraph 1, letter a, of Legislative Decree 128/03, and any updates must be submitted for approval to the Ministry of Education, University, and Scientific and Technological Research (MIUR), after review by the Commission²².

However, the Italian Space Agency (ASI) is allowed to adopt its own regulations, but they must be submitted for approval to the Ministry of Education, University, and Scientific and Technological Research (MIUR), as well as to the Ministry of Economy. The agency is

²⁰ *Ibidem*.

²¹ Il PNR che costituisce il principale strumento di programmazione e di coordinamento della ricerca, è disciplinato dall'art. 1, comma 2 del D.Lgs. 204/98. Di durata triennale, ma aggiornato annualmente, il PNR viene elaborato sulla base del DPEF ed è approvato dal CIPE.

²² Si tratta di un Commissione permanente per la ricerca, nell'ambito della quale il Ministro dell'università coordina l'esercizio delle funzioni attinenti il settore della ricerca affidate al CIPE. La Commissione è stata concretamente istituita con la deliberazione del CIPE 79/98.

also subject to oversight by the Court of Auditors as provided by Article 3, paragraph 7, of the Law of January 14, 1994, No. 20 ²³.

Italy seems to be recognising the importance of having a solid foundation for space production and management activities, supported significantly by the Italian Space Agency (ASI).

Furthermore, the National Recovery and Resilience Plan (PNRR) has invested in the sector with projects aimed at elevating Italy's role in aerospace, particularly in Earth observation and surveillance.

In fact, in 2022, more than 80% of the PNRR resources were allocated to the Italian Space Agency (ASI) ²⁴.

2.3 Italian Space Agency's (ASI) transfer to the new headquarters in Tor Vergata and related issues

The establishment of the first Italian Space Agency's (ASI) headquarters originated in 1983, coinciding with its inception, on the Murgia Terlecchia in Matera, facilitated by the National Space Plan and the Basilicata Region. The Space Geodesy, as the inaugural ASI facility is termed, served as the agency's sole management centre for several years and remains its primary operational hub. In Matera, systems for remote sensing, the ground segment for the Cosmo-SkyMed mission, and activities related to quantum telecommunications are now located.

Another facility situated in Malindi, Kenya, is the Luigi Broglio Center, which hosted various launches until 1988 and presently serves solely for satellite and launcher control and reception activities. Additionally, the Italian Space Agency (ASI) has an establishment in San Basilio (Cagliari), which provides mission support services, and, of course, in Rome, with its main management headquarters finalised in 2012.

²³ *Riordino dell'Agenzia Spaziale Italiana (ASI)*, Camera. Op. cit.

²⁴ *Spazio, assegnato oltre l'80% dei fondi PNRR dell'Agenzia Spaziale Italiana*. Linea Amica, 2022.
<<https://lineaamica.gov.it/news-e-multimedia/news/d/2022/09/13/spazio-assegnato-oltre-l-80-dei-fondi-pnrr-dell-agenzia-spaziale-italiana>>

In 1999, the project for establishing the Tor Vergata campus, in the east of Rome, was approved, initially costing 24 billion lire (approximately €12 million) ²⁵. Thirteen years later, the cost escalated to over €84 million due to a fivefold increase in the building's size from the initial plan ²⁶. The construction of this new headquarters took place under Enrico Saggese's tenure, who led the Italian Space Agency (ASI) from 2009 to 2014, the year of his resignation.

Enrico Saggese, then-President of the agency, appointed himself as head of the Italian Centre for Aerospace Research (CIRA) in 2012, another public institution overseen by the Italian Space Agency (ASI), thereby receiving dual compensation for a total of €170,000 per year ²⁷.

It was immediately viewed as a triple conflict of interest, given that there were four agency council members with voting power and only two of them aligned with Saggese. It is important to note that Mariano Bizzarri and Franco Ongaro, the individuals who voted for Saggese's appointment, are two right-leaning persons, likely inclined towards reciprocating favours.

It was indeed a report from the Court of Auditors that persuaded Minister Profumo to address a letter to Saggese, stating: "Dear Enrico, I take this opportunity to share with you some guiding principles which I am pleased to convey," dated April 16, 2012. "I wish to emphasise that it would be advisable for appointments to the governance bodies of ASI-affiliated companies to be made from individuals distinct from those already part of the Board of Directors." The Minister of Education, University, and Research then suggests, "I propose to proceed with the aforementioned appointments through specific public notices: this procedure allows, on one hand, to ensure the full implementation of the transparency

²⁵ *La nuova sede dell'Asi, costi oltre gli 84 milioni: il faraone Saggese nel mirino dell'Autorità*. La Repubblica, 2013. <https://www.repubblica.it/rubriche/la-scuola-siamo-noi/2013/05/20/news/saggese_faraone-59187385/>

²⁶ *Ibidem*.

²⁷ *Non solo Asi, Saggese nomina se stesso a capo delle ricerche aerospaziali*, 2012, <<https://www.repubblica.it/rubriche/la-scuola-siamo-noi/2012/11/13/news/saggese-46577199/>>

principle and, on the other hand, to make appointments by selecting from a wide range of candidates, evaluated based on their high and qualified professionalism" ²⁸.

Thereby, the Court of Auditors, the State Accounting Office and the Financial Guard promptly scrutinised the whole process of construction of the new headquarters in the east of Rome.

During the audit conducted by the authorities, it was revealed that Fuksas, the architect initially commissioned to design the new headquarters, was compensated with a sum of €1,379,177 following the decision to relocate the company from the Flaminio district to a peripheral area provided by the University of Tor Vergata ²⁹. These expenditures were deemed unnecessary as "the privately agreed indemnity with the architect was not provided for by the rules on professional assignments" ³⁰.

The oversight authority contests the execution of works entrusted through private negotiation to the Roman SAC, alleging that it led to the awarding of contracts under less advantageous conditions for the administration. The Italian Space Agency justified the assignment to SAC, citing "security reasons." Consequently, three changes during the course of the project resulted in 309 price adjustments compared to the 513 used for the project's estimated bidding base.

Therefore, the amounts that increased the overall project budget by 30% were entirely unjustified. Equally absurd were the dimensions of the public offices, which were initially planned to be 28.3 square meters per person but were later increased to 43 square meters per worker for 500 employees, presenting a "pharaonic project" ³¹.

"The new headquarters of the Agency, already in the architectural preliminary design phase, was conceived with the intention of being highly representative and containing

²⁸ *Sprechi, nepotismo, interessi lo stop del ministro sull'Asi*, 2012, <https://www.repubblica.it/scienze/2012/04/25/news/agenzia_spaziale_italiana-33910877/>

²⁹ *La nuova sede dell'Asi, costi oltre gli 84 milioni: il faraone Saggese nel mirino dell'Autorità*, 2013, <https://www.repubblica.it/rubriche/la-scuola-siamo-noi/2013/05/20/news/saggese_faraone-59187385/>

³⁰ *Ibidem*.

³¹ *Ibidem*.

ancillary functions rarely found in other public administrations" ³². Saggese, metaphorically referred to as a pharaoh, erected a cathedral during years of austerity ³³.

Seven individuals were investigated for alleged bribery, including Francesca Sette, Mario Giacomo Sette, Elena Oteri, Alfiero Pignataro, Salvatore Marascia, Vittorio Sette, and, notably, Enrico Saggese. These investigations stemmed from a report by an agency executive who was a victim of attempted extortion and retaliation. Consequently, charges of corruption and extortion were hypothesised, depending on the individuals' roles. In addition to inspecting the Italian Space Agency (ASI) headquarters at Tor Vergata, the residences of the suspects and affiliated companies were searched. These included Sistina Travel (responsible for organising trips for ASI employees), the Italian Center for Aerospace Research (CIRA), Get-it, Eurofiere, Art Work, and Space Engineering.

As a consequence of all this turmoil, in February 2014, Enrico Saggese dispatched a letter to Maria Chiara Carrozza, the Minister of Education, University, and Research at the time, tendering his resignation as President of the Italian Space Agency (ASI) with immediate effect. This decision was made in accordance with the ongoing investigations, even though he was reaffirming his innocence regarding the events. His resignation aimed to defend his integrity, honour, and prestige grown in forty years of activity in the space sector. ³⁴

However, in 2020, Enrico Saggese was freed of the charge of attempted extortion "because the fact does not exist," charge that would have resulted in a four-year prison sentence. Nevertheless, the defence underscores that for this "unfounded" accusation, Saggese was arrested and placed under house arrest in 2014. Despite this, they retain imperative to maintain full confidence in the judicial system.

³² *Ibidem.*

³³ *Ibidem.*

³⁴ *Enrico Saggese si dimette dall'Asi*, 2014, <<https://www.scienzainrete.it/contenuto/news/enrico-saggese-si-dimette-dallasi/febbraio-2014>>

THIRD CHAPTER: The Italian Space Agency (ASI) as tool for European and international policies

3.1 Cooperation with the European Space Agency (ESA)

The Italian Space Agency (ASI) encompasses among its responsibilities the promotion, support, and coordination of Italy's participation in the European Union's projects and initiatives.

In accordance with the 1999 Lisbon Treaty, in particular with Article 4 and Article 189 of the Treaty on the Functioning of the European Union, space policy has been positioned at the forefront of the Europe 2020 strategy and the new industrial revolution ³⁵.

However, the origins of the European Space Agency (ESA) date back much earlier. Towards the end of the 1950s and at the beginning of the 1960s, the potential of space exploration and artificial satellites began to be understood. It became evident that if Europe wished to carve out a role in space missions, efforts needed to be coordinated.

Consequently, established in 1975, the European Space Agency (ESA), ranking third globally in financial resources, became specialised in astronomical research, Earth observation, and space exploration. Presently, the agency comprises 22 member states, among which, Italy, represented by the Italian Space Agency (ASI), has been actively contributing to the European Space Agency's (ESA) endeavours for several years.

The European Space Agency's (ESA) activities are divided into two categories: mandatory and optional programmes. Mandatory activities of the European Space Agency (ESA) entail predominantly scientific pursuits, encompassing infrastructure costs and fundamental operational activities. All member states of the European Agency are obliged to provide a mandatory financial contribution, calculated proportionally to each country's gross domestic product (GDP), as determined by the ESA Council. While, optional programmes

³⁵ *L'ASI IN ESA*. (n.d.). Agenzia Spaziale Italiana. <<https://www.asi.it/agenzia/lasi-nel-mondo/lasi-in-esa/>>

allow for discretionary participation, enabling each country to determine its level of contribution, albeit with a predefined minimum subscription value, also computed as a percentage relative to the gross domestic product (GDP).

Contributions to the European Space Agency (ESA) are not granted as outright subsidies but adhere to the principle of *quid pro quo*, whereby engagement in the agency's activities translates into economic benefits.

The proportional nature of investments made by each member state is the reason for the agency's expansion in both membership and budget over the years.

The purpose of establishing a European space agency is to enable the launching and financing of projects in collaboration with member states, with the aim of participating in programmes, conducting studies and research, and organising conferences and updates for scientists.

"The agreement - Minister Moratti declared - is particularly important, firstly because the roles are clearly defined: the Commission and Europe as political factors that stimulate demand, and the ESA as a supplier of supply and services in a market where public demand is very important because the commercial market has not yet developed to allow companies to have a possible return without significant demand stimulated by governments" ³⁶.

3.2 Evolution of the Ministerial Councils of the European Space Agency (ESA)

The Ministerial Council of the European Space Agency (ESA) has had an important evolution over the years, which has brought consistent developments in funding.

The first Ministerial Council convened in Paris in 1977, where it announced the launch of a comprehensive communications satellite programme and passed a resolution to establish the Earthnet programme that same year.

³⁶ *Spazio: ESA e UE firmano Accordo di Cooperazione*. The European Space Agency.
<[https://www.esa.int/Space_in_Member_States/Italy/Spazio ESA e UE firmano Accordo di Cooperazione](https://www.esa.int/Space_in_Member_States/Italy/Spazio_ESA_e_UE_firmano_Accordo_di_Cooperazione)>

The second one took place in Rome in 1985, where it was granted an increase of 5% over the next five years, for the science programme in which, France started to have significance in the aerospace field at European level ³⁷.

The third Ministerial Council occurred in the Netherlands, precisely, in The Hague, in 1987, when the European Space Agency (ESA) began to propose Long-term Space Plan and Programmes.

Therefore, the next one was taken in Toulouse, France, eight years later, in 1995, when the members of the agency started to give financial contributions for the creation of the International Space Station (ISS).

In 2001, the Ministerial Council occurred in Edinburgh, where the budget amounted to nearly €8 billion ³⁸. Just two years later, the agency's members reconvened in Paris to adopt a resolution aimed at strengthening the relationship between the European Space Agency (ESA) and the European Union (EU).

In Berlin, in 2005, the Ministers approved a European Launcher Policy, together with decisions concerning the Level of Resources for scientific activities and ongoing optional programmes.

In 2008, a Ministerial Council took place in The Hague, where the members of the agency cooperated with the European Commission in order to further enhance Europe's role in the space sector. Differently from the previous conferences, it was discussed the importance of growing economically, together with innovating the system and creating strategic independence.

“As President of the ESA Council of Ministers,” said Gelmini, “I will work to ensure that Europe plays a leading role on the international stage at a time when India and China are also making significant advances in the space competition arena” ³⁹.

³⁷ *Ministerial Council, Rome, 1985*. The European Space Agency, 2008. <https://www.esa.int/About_Us/Law_at_ESA/Ministerial_Council_2008/Ministerial_Council_Rome_1985>

³⁸ *Ministerial Council, Edinburgh, 2001*. The European Space Agency, 2008. <https://www.esa.int/About_Us/Law_at_ESA/Ministerial_Council_2008/Ministerial_Council_Edinburgh_2001>

³⁹ Chiara De Felice, *SPAZIO: ITALIA GUIDA AGENZIA UE E COMBATTE RECESSIONE/ANSA*. Ansa, 2008. <https://global.factiva.com/ga/default.aspx?page_driver=searchBuilder_Search&>

Moreover, a resolution for the next five years was adopted in order to organise space activities, as well as a draft plan to establish its financial management reform, decision-making processes, and policies.

Already in 2012, in Naples, €10 billion was allotted for the European Space Agency's (ESA) activities for the following years ⁴⁰.

One thing is certain, though: over the years of the European Space Agency's Ministerial Councils, Germany, France, and Italy have consistently been the agency's largest contributors. In fact, in 2020, the ESA budget reached €14.39 billion, with Italy increasing its contribution to €2.28 billion that year ⁴¹.

This increase is likely attributed to the rising global interest in space exploration frontiers and the technological and scientific advancements fostered by the space sector. These advancements include services and applications derived from space infrastructures, such as precision agriculture, personalised medicine, Earth observation, and telecommunications.

Additionally, the political prestige associated with space activities and their strategic significance cannot be overstated. The space sector in Europe is crucial for border monitoring, security, and international cooperation.

3.3 Cooperation with the National Aeronautics and Space Administration (NASA)

Italy has long played a prestigious role in the global space community through its Italian Space Agency (ASI), not only within the European Union, but also through established cooperative relationships with various aerospace agencies worldwide.

⁴⁰ *European Ministers decide to invest in space to boost Europe's competitiveness and growth*. The European Space Agency, 2012.

https://www.esa.int/About_Us/Ministerial_Council_2012/European_Ministers_decide_to_invest_in_space_to_boost_Europe_s_competitiveness_and_growth

⁴¹ Gianni Dragoni, *Accordi e finanziamenti; al lavoro con gli USA e con la Ue nella corsa all'industria spaziale*. Il sole 24 Ore, 2020.

https://global.factiva.com/ga/default.aspx?page_driver=searchBuilder_Search&

One of the most significant partners for Italy in terms of cooperation is the United States of America, with which Italy has cultivated a particularly close relationship. With the National Aeronautics and Space Administration (NASA), the United States' Space Agency, Italy has maintained continuous bilateral ties since the 1960s, governed by agreements renewed and expanded over the years.

The collaboration with the United States space agency has led Italy to participate in numerous noteworthy scientific missions in recent years, exemplified by the construction of the International Space Station (ISS), wherein Italian industry contributed to over 50% of the pressurised modules ⁴².

Not only do collaborative efforts at a scientific level between the two space agencies encompass their joint involvement in the construction of the International Space Station (ISS), but they also extend to research, technological development, the exchange of scientific data, and the participation in space exploration initiatives.

The Italian Space Agency (ASI) and NASA do not possess a specific treaty, but rather a series of agreements known as *Memoranda of Understanding* (MoU), which are collaborative provisions designed to regulate their bilateral relations.

For instance, concerning the construction of pressurised modules for the International Space Station (ISS), on October 9, 1997, a *Memorandum of Understanding for the design, development, operation, and utilisation of three Mini Pressurised Logistics Modules* was concluded with NASA. The MoU came into effect following the exchange of diplomatic notes between the Italian government and the United States government ⁴³.

Another illustrative instance is the 2016 ratification by the Italian government of the Agreement between the United States and Italy concerning cooperation between the two agencies, initially signed in Washington in 2013 ⁴⁴.

⁴² Gabriella Arrigo, *L'Agenzia Spaziale Italiana e la Cooperazione Internazionale*. Agenzia Spaziale Italiana, 2021. <<https://iila.org/wp-content/uploads/2021/11/ARRIGO-lecture-IILA-MERCOSUR-Nov-2021.pdf>>

⁴³ *Attività relative a "Assessment of the cerebral venous outflow in a microgravity environment through the detection of jugular venous pulse oscillations – Drain Brain 2.0"*, Agenzia Spaziale Italiana e Università degli Studi di Ferrara, 2021. <https://www.unife.it/it/ricerca/parteneriati/convenzioni-unife-per-ricerca/contratto_asi_n-2021_1_r-0_drain_brain_2-0-pdf-p7m-pdf.p7m>

⁴⁴ *L'ASI e i rapporti internazionali. L'Italia e l'ASI giocano da tempo un ruolo prestigioso e riconosciuto all'interno della comunità spaziale internazionale extra UE, avendo stabilito rapporti e attività di cooperazione con diverse agenzie spaziali nazionali - regolati da accordi di cooperazione, rinnovati ed*

The purpose of this agreement is to "consolidate the significant scientific and technological exchange between the two countries"⁴⁵. By doing so, Italy and the United States of America have established the legal framework for cooperation in the field of exploration and utilisation of outer space. "The signing of the Agreement coincides with the celebrations of the first 50 years of cooperation in the space field between the two countries"⁴⁶.

In 2019, a joint declaration of intent was also signed between the Italian Space Agency (ASI) and NASA for the project involving the return to the Moon and a long-term programme for human exploration of Mars.

"As a government, we are particularly proud of this achievement," said Fraccaro, according to whom, "Italy's leadership role in the space sector takes another step forward. The agreement between NASA and ASI will strengthen the existing bilateral relations both in terms of scientific research and human exploration, starting with the Artemis programme to return humans to the Moon"⁴⁷. The undersecretary then recalled how "Italy already makes a significant contribution to international space programmes today, particularly through technological and scientific contributions to the International Space Station and the expertise we can boast in the development of pressurised modules"⁴⁸.

In 2023, further enhancement of relations between the Italian Space Agency (ASI) and NASA was realised through a joint declaration signed by the President of the United States, Joe Biden, and the Italian Prime Minister, Giorgia Meloni, marking the commencement of a fresh dialogue in the realm of space exploration and fostering commercial and industrial exchanges between the two nations.

ampliati nel corso degli anni. Agenzia Spaziale Italiana. <<https://www.asi.it/lagenzia/lasi-nel-mondo/lasi-e-i-rapporti-internazionali/>>

⁴⁵ *Relazione del disegno di legge recante ratifica ed esecuzione dell'accordo quadro tra il Governo della Repubblica Italiana e il Governo degli Stati Uniti d'America per la cooperazione nell'esplorazione ed utilizzazione dello spazio extra-atmosferico per scopi pacifici, fatto a Washington il 19 Marzo 2013. <<https://www.governo.it/sites/governo.it/files/78374-10169.pdf>>*

⁴⁶ *Ibidem.*

⁴⁷ *Spazio, Nasa e Asi rinsaldano il loro rapporto: le prossime missioni lunari Usa parleranno anche italiano. Il Fatto Quotidiano, 2019. <<https://www.ilfattoquotidiano.it/2019/10/24/spazio-nasa-e-asi-rinsaldano-il-loro-rapporto-le-prossime-missioni-lunari-usa-parleranno-anche-italiano/5531446/>>*

⁴⁸ *Ibidem.*

FOURTH CHAPTER: The role of the Italian Space Agency (ASI) in the current space context

4.1 Creation of a Prime Minister's Space Steering Committee

The steering committee for the Italian Space Economy does not have a specific birth date; rather, it has been the subject of debate and development in recent years.

In particular, since 2017, there has been a growing call for coordinated management in the space economy. This demand arises from the sector's significant financial growth, as evidenced by a revenue of €1.6 billion. The industry employs over 6,000 individuals and generates up to €5 for every €1 invested in the aerospace sector ⁴⁹.

During the February 2017 event on Italian Space Economy at the Centro Studi Americani in Rome, a discussion emerged about the future of space between the Minister of Economic Development, Carlo Calenda, the Minister of Education, Valeria Fedeli, and senior officials from the Italian Space Agency (ASI). The Ministry of Enterprises and Made in Italy (MISE) and the Ministry of University and Research (MUR) addressed strategies for Italian space activities to establish a coordinated management body as quickly as possible.

The concept of a management body was first proposed in the previous year, 2016, involving collaboration among the government, regional authorities, research institutions, universities, and industries. The proposed legislation aimed to establish an Interministerial Committee for Space, encompassing all key stakeholders in Italy. The Minister of Education Valeria Fedeli emphasised the need for highly qualified workers with advanced skills, stating that they "generate innovation and new growth opportunities" ⁵⁰.

Carlo Calenda, then Minister of Economic Development, affirmed the government's commitment to advancing the aerospace sector. Roberto Battiston, President of the Italian Space Agency (ASI), however, highlighted the necessity of considering international

⁴⁹ Andrea Frolla, *Space Economy, in Italia vale 1,6 miliardi. Fedeli: "Cabina regia diventi legge"*. Corriere Comunicazioni, 2017. <<https://www.corrierecomunicazioni.it/digital-economy/space-economy-in-italia-vale-16-miliardi-fedeli-cabina-regia-diventi-legge/>>

⁵⁰ *Ibidem*.

competition, such as Elon Musk's SpaceX, and stressed the importance of unity to effectively meet the challenges posed by this new era of space competition.

The steering committee was initially established by Law No. 7/2018, creating the committee under the direction of the Presidency of the Council of Ministers ⁵¹. Lorenzo Fioramonti, Deputy Minister of Education, University, and Research, announced during the conference "Italy of Space," organised by the Ministry of Foreign Affairs and the Italian Space Agency (ASI) at Farnesina, that the Interministerial Committee will direct Italy's activities in the field of the Italian Space Economy. The idea was to strengthen the Space Steering Committee since the aerospace sector is becoming increasingly central, also thanks to progress in the field of research. For instance, Italy is at the forefront for having achieved the goals of the 2030 Agenda through the use of space-applied technologies, preventing environmental emergencies, and monitoring the atmosphere, pollution, and global warming.

However, it was only in 2021 that the highest governing body of the National Recovery and Resilience Plan (PNRR) was established through Decree-Law 77/2021: a steering committee chaired by the President of the Council ⁵².

This body is responsible for monitoring the implementation of the plan, promoting coordination among different levels of governance, and having the authority to decide on any substitute powers. Article 2 of Decree-Law No. 77 of May 31, 2021, outlines the primary functions of the steering committee ⁵³.

The objective of establishing a steering committee is to monitor and conduct periodic assessments of the implementation status of the various components of the National Recovery and Resilience Plan (PNRR), as each semester includes a specific number of milestones to be achieved. This steering committee is composed of government Ministers and the Undersecretary of State to the Presidency of the Council of Ministers, who are responsible for various thematic areas. Representatives of the implementing entities and their

⁵¹ L'Italia punta sulla space economy: al via la nuova cabina di regia. Corriere comunicazioni, 2018.

<<https://www.corrierecomunicazioni.it/tech-zone/litalia-punta-sulla-space-economy-al-via-la-nuova-cabina-di-regia/>>

⁵² Si riunisce oggi la prima Cabina di Regia del PNRR. Osservatorio Recovery Plan.

<<https://www.osservatoriorecovery.it/si-riunisce-oggi-la-prima-cabina-di-regia-del-pnrr/>>

⁵³ Funzioni della Cabina di Regia. Governo Italiano: Presidenza del Consiglio dei Ministri, 2021.

<<https://www.governo.it/it/approfondimento/funzioni-della-cabina-di-regia/18143>>

respective bodies associated with the topics addressed may attend the sessions of this steering committee.

To summarise, the PNRR Steering Committee is the entity that holds political authority and coordinates the implementation of the PNRR interventions. In this context, the steering committee also pertains to the space sector, as its goal is to promote and implement the coordination of Italian space policy.

Naturally, all institutional stakeholders involved in space policies, such as the Italian Space Agency (ASI), are engaged in these discussions. The Space Steering Committee thus serves as a meeting point for strategic decisions and coordinated actions.

The most significant outcome of this body is the Strategic Space Economy Plan, which outlines the intervention strategies to be implemented in the Italian space industry sector.

Therefore, the Space Steering Committee coordinates Italian space policies and fosters collaboration among public entities (including the Italian Space Agency), industries, and institutions to promote the optimal development of the aerospace sector.

4.2 Priority given to space: the growth of Italian space budgets

As elucidated in the preceding chapter, the programmes of the European Space Agency (ESA) are categorised into mandatory and optional activities, yet Italy's level of participation has not remained constant over the years. Italy's support has always served as a crucial complement to national programmes, fostering the development of the industry within the European context. The involvement of the Italian Space Agency (ASI) in ESA programmes facilitates the generation of competitive advantages.

These two different programmes, mandatory and optional, are delineated during Ministerial Council meetings, during which member states of the agency are required to grant

a predetermined financial contribution and decide whether to provide the optional allowance for the ensuing triennial ⁵⁴.

For instance, in 2005, the Space Ministerial Council was held in Berlin, during which the European Space Agency (ESA) requested €10.3 billion for the triennial (€3.4 billion per year), aiming to remain consistent with previous budget allocations while accommodating European needs. In 2006, Italy contributed to mandatory activities with a percentage of 12.85% of the total budget, while regarding optional programmes, it participated with a percentage of 14%, in both cases ranking behind Germany and France ⁵⁵.

For the year 2008, the Triennial Plan of Activities of the Italian Space Agency (ASI) announces a total contribution of €402 million (out of the total ESA budget of approximately €3 billion), comprising €370 million from the ordinary contribution of the Ministry of Education, Universities, and Research (MIUR), with the remainder allocated under the provisions of Law 10/2001 for navigation sector programmes ⁵⁶.

Italy's financial commitment to the European Space Agency (ESA) underscores its dedication to advancing space exploration and research initiatives, both domestically and within the broader European framework.

Regarding Italy's contribution until 2014, the total budget amounted to €4.5 billion, with €617 million allocated to mandatory activities and €3.9 billion to optional programmes ⁵⁷.

This allocation of resources reflects Italy's strategic prioritisation of scientific advancement, technological innovation, and international collaboration in the space sector. It also highlights Italy's recognition of the importance of investing in optional programmes, which offer flexibility and the opportunity for tailored participation in projects aligned with national interests and objectives.

⁵⁴ *Competitività e sviluppo per lo spazio europeo*. The European Space Agency.

<https://www.esa.int/Space_in_Member_States/Italy/Competitivita_e_sviluppo_per_lo_spazio_europeo>

⁵⁵ *Resources Management. Annual Report 2006*. The European Space Agency, 2006, pp. 110.

⁵⁶ *ESA facts and figures. Ministerial Council 2008*. The European Space Agency, 2008.

<https://www.esa.int/About_Us/Law_at_ESA/Ministerial_Council_2008/ESA_facts_and_figures2#:~:text=ESA's%20budget%20for%202008%20was%20€3028%20million>

⁵⁷ *Piano Strategico Space Economy. Quadro di posizionamento nazionale*, 2016, pp. 59.

Nonetheless, in the budget from the year 2015 onwards, Italy had to decrease its contribution to the European agency, amounting to a total of €2.3 billion, comprising €525 million allocated to mandatory activities and €1.8 billion to optional programmes, representing a significant reduction compared to previous years⁵⁸.

This cutback underscores the economic constraints or strategic shifts that Italy may have encountered during this period, potentially impacting its capacity to maintain previous levels of financial support for ESA initiatives.

The 2016 ESA Ministerial Council, convened in Lucerne with a programme budget exceeding €10 billion, yielded a favourable outcome, particularly notable for Italy. Italy's contribution amounted to €512 million, establishing it as the third-largest financier of the agency, commanding a 13.4% share, behind Germany and France⁵⁹.

During the subsequent Ministerial Council meeting held in Seville in 2019, the total budget allocated by the 22 member states increased from €10.3 to €14.4 billion, surpassing the proposal put forth by the ESA General Director Jan Wörner⁶⁰. Wörner expressed surprise at the significant support shown, indicating a robust endorsement of ESA's strategic vision and objectives by its member states. "To bring together our 22 member states, governments that regularly change, and agree on such inspiring projects to share a common future in space might seem like an impossible task on paper. But in two days, in Seville, we have shown that this is possible," says Wörner. "It is possible because we work together to develop good programmes, and it is possible because people are dedicated, investing all their efforts in a long and careful decision-making process that involves the scientific community, industry, and national delegations"⁶¹.

At the 2019 ESA Ministerial Council meetings, Italy consistently ranks as the third-largest contributing country to the European Space Agency, following Germany and France. However, Italy's commitment has notably increased, as evidenced by its proposal for a total

⁵⁸ *Ibidem*.

⁵⁹ *Spazio, cresce l'Italia ma rallenta ExoMars. ESA presenta il budget per le attività 2016*. Redazione Media Inaf, 2016. <<https://www.media.inaf.it/2016/01/19/budget-spazio-esa-2016/>>

⁶⁰ Marco Malaspina, *Ministeriale Esa, segno più per l'Italia e la scienza. Samantha Cristoforetti tornerà in orbita*. Redazione Media Inaf, 2019. <<https://www.media.inaf.it/2019/11/29/ministeriale-esa-2019/>>

⁶¹ *Ibidem*.

subscription of €2.28 billion, constituting 15.9% of the total contribution from the agency's 22 member states ⁶².

During the 2022 ESA Ministerial Council held in Paris, a budget of €16.9 billion was established for the subsequent three years. This total figure represents a 17% increase compared to the allocation set in Seville in 2019, a noteworthy accomplishment given the inflationary trends of recent years ⁶³. This delineation of priorities and the direction of the extraterrestrial ambitions of the 22 member countries of ESA has thus been established. On this occasion, Italy allocated over €3 billion, marking its highest contribution in history and representing 18.2% of the total budget, thereby maintaining its position as the third-largest contributor to the European Space Agency (ESA) ⁶⁴.

"The Italian subscription is a historic one, both in terms of absolute value and percentage, as well as positioning compared to the other two major contributors," comments Saccoccia, the head of the Italian Space Agency (ASI). "We are the top subscribers to optional programmes, while, considering the percentages of overall contributions, Germany has lowered its share, and France has nearly matched ours. More generally, it was a Ministerial Council with significant content, which will enable us to provide opportunities to the entire industrial supply chain" ⁶⁵.

4.3 Is the Italian Space Agency (ASI) keeping up with this growth?

At this juncture, it is crucial to carefully examine the current state of the Italian space industry, with particular attention to investments within the framework of the National Recovery and Resilience Plan (PNRR), and to explore the future prospects of applicable strategies in this sector. It is well understood that the aerospace industry is undergoing a

⁶² *Ibidem*.

⁶³ Emilio Cozzi, *Il futuro dello spazio europeo visto dalla Ministeriale dell'EsA. Risultati, prospettive e criticità di quanto deciso all'appuntamento più importante dell'agenda spaziale europea, dove l'Italia ha messo sul piatto più di 3 miliardi di euro*, Wired, 2022. <<https://www.wired.it/article/consiglio-ministeriale-esa-2022-analisi-dettagli/>>

⁶⁴ *Ibidem*.

⁶⁵ *Ibidem*.

transformation. It is no longer the exclusive domain of state actors; private entities, such as Elon Musk's Starlink, are increasingly entering the space race.

The Italian government's commitment to growth in the aerospace sector is evidenced primarily by the substantial funding allocated through the National Recovery and Resilience Plan (PNRR) to the Space Economy, with significant resources directed towards the development of new and ambitious projects.

"We are talking about projects that are significant relative to PNRR standards," emphasised Giulio Gottardo, a researcher at the PNRR Lab. "The average size of the nine Italian projects is €250 million, a figure 300 times higher than the average PNRR project, which is €750,000. This is a positive sign because it indicates that in the space economy sector, there is no fragmentation of resources as seen in other areas, and the implementing entities are only two: ESA and ASI. Additionally, it is significant that out of nine projects, six have already recorded actual payments, with a rate of 67%, well above the PNRR average of 15%. This is a tangible indicator of the progress in implementation" ⁶⁶.

In recent years, due to the resources provided by the government to the space economy, Italy experienced unprecedented opportunities. However, to effectively respond to the initiatives of the National Recovery and Resilience Plan (PNRR), investments from the private sector are necessary to contribute to economic expansion.

In 2022, it was estimated that the Italian space economy generated a revenue of over €2 billion and employed approximately 7,000 highly skilled individuals ⁶⁷.

The Italian Space Agency (ASI) has significantly contributed to the promotion and support of start-ups through its innovative instruments. In 2017, the Italian Space Agency (ASI) established the E. Amaldi Foundation, which leverages the space economy as a catalyst for innovation and technology transfer. This foundation led to the creation of Primo Space, an Italian venture capital fund with participation from both institutional and private investors.

⁶⁶ *PNRR e Space Economy: Le prospettive di crescita e il ruolo dell'Italia nella corsa allo spazio*. SDA Bocconi. <<https://www.sdabocconi.it/it/news/24/2/pnrr-e-space-economy-le-prospettive-di-crescita-e-il-ruolo-dellitalia-nella-corsa-allo-spazio>>

⁶⁷ *Agenzia Spaziale Italiana ASI: cos'è, storia e attività*. Space Economy 360, 2022. <<https://www.spaceeconomy360.it/politiche-spazio/agenzia-spaziale-italiana-asi-cose-storia-e-attivita/>>

The agency's active involvement is making the sector more dynamic and competitive. The agency has transitioned from solely providing support, consultation, and coordination to actively promoting the Italian space economy, engaging private actors, and strengthening the overall vision of the industry.

Additionally, the Italian Space Agency (ASI) has launched the annual “Italian Space Industry” publication to publicise the sector internationally, along with the interactive platform [Italianspaceindustry.it](https://italianspaceindustry.it) and the D.V.Asi portal.

In recent years, thanks to the National Recovery and Resilience Plan (PNRR) and other programmes such as Cassa Depositi e Prestiti and the Artemis programme, the Italian Space Agency (ASI) has access to substantial budgets dedicated to investing in the aerospace industry. Collaboration with institutions, universities, and research entities has been crucial, enabling the development of the aerospace sector in alignment with its users' needs, thus, raising awareness on the benefits of space exploration.

The most significant transformation in the aerospace sector has been the redefinition of the relationship between public and private entities, marking a paradigm shift. Public actors have been compelled to innovate and strengthen their capabilities in response to the growing interest from the private sector, initiating a new evolutionary process.

There is now greater emphasis on cost reduction and sustainable growth within the sector. The Italian aerospace industry comprises a complete supply chain, from highly specialised small enterprises to large entities undertaking major initiatives.

It is now evident how much Italy is focusing on this sector, to the extent that for the period 2023-2027, public funding of over €7 billion has been planned ⁶⁸.

Italy's position in the space economy is distinctly on the rise. Italy's stature reflects its contribution to the European Space Agency (ESA), and in 2022, it became the leading country in terms of optional space programmes.

⁶⁸ *A Roma gli stati generali dell'industria aerospaziale, un settore da 3 miliardi in crescita*. Rai News.it, 2024. <<https://www.rainews.it/articoli/2024/05/a-roma-gli-stati-general-della-space-economy-un-settore-da-3-miliardi-in-crescita-778d5953-2220-4d04-8132-cf58d9d45e72.html>>

Furthermore, this year, 2024, marks the 60th anniversary of the launch of the first San Marco satellite, a milestone that placed Italy third in the world for successfully putting a satellite into orbit.

Therefore, sixty years later, Italy remains a hub of space excellence, and with government funding, it continues to play a significant role at the global level.

Saccoccia, former President of the Italian Space Agency (ASI), said on this matter: "There is certainly still a long way to go: let this spaceship continue on its course, let us support it so that it can increasingly be a source of returns, an instrument of inspiration, and a reason for pride for an Italy that knows how to look to its future with confidence" ⁶⁹.

⁶⁹ Asi, Saccoccia: "*Crescita attesa anche per il prossimo quadriennio*". Space Economy 360, 2023. <<https://www.spaceeconomy360.it/competenze-e-lavoro/asi-da-governo-oltre-10-miliardi-di-risorse-saccoccia-crescita-attesa-anche-per-il-prossimo-quadriennio/>>

CONCLUSION

With this thesis, it is possible to delineate the rich history of Italy's space endeavours, focusing on the formation and growth of the Italian Space Agency (ASI) and its vital contribution to European and global space policies.

It outlines why the agency was established relatively late and in a certain period, building on the efforts of the National Research Council (CNR). The Italian Space Agency (ASI) was conceived to enhance Italy's space capabilities, unify programmes, and manage prominent initiatives and collaborations.

Attention is given to the agency's organisational structure and internal governance, particularly in relation to the National Recovery and Resilience Plan (PNRR).

It is discussed the establishment of the agency's new headquarters in Tor Vergata, Rome, along with the corruption investigation of former President Enrico Saggese.

A significant aspect of the Italian Space Agency (ASI) is definitely the partnership with the European Space Agency (ESA) and the collaborations with international agencies, such as the National Aeronautics and Space Administration (NASA). These cooperations indicate how the agency has gained a key role at the global level in the space sector.

This thesis delves into the creation of the Prime Minister's Space Steering Committee, which coordinates Italy's space activities and encourages the need for unified efforts in order to compete internationally. Moreover, this committee oversees the implementation of the National Recovery and Resilience Plan (PNRR) directives, supporting stakeholder coordination.

Therefore, it highlights the shift towards greater private actors' involvement and the importance of public-private teamwork in driving the Italian aerospace sector's advancement and competitiveness.

"Despite the succession of four governments during this period, despite the pandemic and the war in Ukraine, institutional support for the space sector has never waned," acknowledges the former president of the agency ⁷⁰.

⁷⁰ Franco Malerba, *Più budget, più progetti, più missioni: quattro anni di successi per l'Agenzia Spaziale Italiana*. La Stampa, 2023.

It is, thus, undeniable that, in recent years, there has been a significant expansion in the initiatives undertaken by the Italian Space Agency (ASI). This growth has been substantially supported by a marked increase in funding. The budget has nearly tripled, rising from €800 million in 2018 to €2.3 billion in 2023 ⁷¹. Furthermore, with the addition of €2.5 billion from the National Recovery and Resilience Plan (PNRR), the Italian Space Agency (ASI) has secured a total of €10.3 billion over the four-year period ⁷².

These significant achievements in the space sector are also a result of financial support from Italian government policies. The successes of the agency are likely attributable to the new governance framework that, since 2018, has seen the involvement of the Presidency of the Council of Ministers in aerospace matters.

The Italian Space Agency (ASI), no longer supervised by the Ministry of University and Research (MUR) as in the past, now functions as an economic policy entity, responding to the strategic needs and commitments of various ministries involved in its governance.

Since 2018, the Italian Space Agency (ASI) has been operating based on objectives set by the Italian government, supporting research and innovation, and promoting economic growth and development, thereby elevating the country to high international standards. In recent years, funding for the European Space Agency's (ESA) Ministerial Councils has also increased, driven by the growth of the Italian space economy, which has successfully managed a higher volume of activities compared to the past.

The quantity of space-related agreements signed by the ASI in recent years is objectively extraordinary: 67 international agreements, 24 agreements with universities, and 26 more with national research institutions ⁷³.

The agency has become a sought-after partner for countries lacking the industrial capabilities to meet their ambitions and seeking a reliable partner for collaboration. Notably, Ukraine, with its strong space history, aims to rebuild its capabilities, starting with Italy.

https://www.lastampa.it/tuttoscienze/2023/05/03/news/piu_budget_piu_progetti_piu_missioni_quattro_anni_di_successi_per_lagenzia_spaziale_italiana-12782374/

⁷¹ *Ibidem*.

⁷² *Ibidem*.

⁷³ Lazio, *Terminano i 4 anni di Saccoccia all' Agenzia Spaziale Italiana: budget record e successi internazionali*. *Ti Lancio*, 2023. <https://tilancio.com/lazio-terminano-i-4-anni-di-saccoccia-allagenzia-spaziale-italiana-budget-record-e-successi-internazionali/>

Nevertheless, the Italian Space Agency (ASI) is restrained in several aspects.

Firstly, the agency's dimensions have not kept pace with the rapid expansion of the Italian aerospace sector. This mismatch between the body's capacity and the industry's demand might result in operational inefficiencies and may hinder its ability to work effectively, slowing down organisational processes.

Moreover, the regulatory framework governing the agency is outdated. Many of the rules and regulations were established in a different era, when the aerospace sector was still not as dynamic and technologically advanced as it is today. This obsolete legal framework imposes significant bureaucratic hurdles, preventing the Italian Space Agency (ASI) from acting smoothly in response to new developments and challenges.

Additionally, these bureaucratic obstacles are unfavourable to small and medium-sized enterprises (SMEs) within the industry. Unlike larger corporations, these companies often do not have the resources to maintain extensive administrative departments for their management. Therefore, more attention should be paid to small and medium-sized enterprises (SMEs) in order to allow them to participate to this joint growth.

Addressing these issues through structural reform and regulatory updates would be crucial to ensuring effective support for the Italian Space Agency (ASI) and mitigating the adverse effects on small and medium-sized enterprises (SMEs).

In light of the study presented in this thesis, it is evident that several areas could be further investigated and developed.

Future research could explore the impact of decentralising certain functions within the Italian Space Agency (ASI) to enhance flexibility and operational efficiency. This could involve an in-depth analysis of the potential benefits of how shifting specific responsibilities and decision-making processes might improve responsiveness and foster innovation. It may lead to more effective resource management and increased engagement with regional stakeholders.

Likewise, another area that could be deepened is the formulation of a modern regulatory framework governing the agency. This research could be based on identifying specific outdated regulations and suggesting updates that would align with the current industry needs. Proposed ideas could include streamlined approval processes, more flexible

compliance requirements, and regulations that better accommodate the aerospace sector. It would be crucial to engage with the industry's stakeholders during this research period in order to ensure the project's success.

Embracing these avenues for future research offers the Italian Space Agency (ASI) the opportunity not only to surmount its present constraints but also to ascend to greater heights, thereby establishing Italy as a leader in the global aerospace sector.

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