

Measuring France Hegemony in the European Space Agency (ESA)

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Abstract

Control over resources, actors, and events and outcomes are three of many approaches offered by International Relations studies in terms of measuring power. This paper highlights the crucial role of power measurement in astropolitics, based on the context of the European Union (EU). In particular, it focuses on France's hegemony in the European Space Agency (ESA) using the Hegemonic Stability Theory (HST) to observe the structural power within the ESA. To analyze this, the author uses the regime concept and the theory of hegemonic stability. The research method in this article uses qualitative methods, taking credible sources from various literature such as website articles, mass media, conference publications and scientific articles. This paper reveals that regardless of France's domination in knowledge and funds, France is not the hegemonic power in the ESA. While an organization is normally featured with domination, this paper argues that power domination in the ESA is dynamically shared among the country members to accomplish a more collaborative rather than dominative feat. This leads to a solid structure within the ESA and renders power-based domination irrelevant.

Keywords: European Space Agency, France, Hegemony, Outer space

Abstrak

Kontrol atas sumber daya, aktor dan peristiwa serta hasil adalah tiga dari berbagai pendekatan yang ditawarkan oleh studi hubungan internasional dalam mengukur kekuatan. Tulisan ini berfokus pada pentingnya dalam mengukur kekuatan dalam menganalisis dinamika politik luar angkasa di Uni Eropa, yang berfokus pada hegemoni Perancis dalam Badan Antariksa Eropa atau sering disebut dengan ESA. Untuk menganalisis hal tersebut, penulis menggunakan konsep rezim dan teori stabilitas hegemoni. Metode penelitian dalam artikel ini menggunakan metode kualitatif, dengan mengambil sumber kredibel dari berbagai literatur seperti artikel situs, media massa, publikasi konferensi, dan artikel ilmiah. Tulisan ini menemukan bahwa, terlepas dari dominasi Perancis dalam hal pengetahuan dan pendanaan, tidak cukup dalam upaya hegemoni organisasi tersebut dan menjadi kekuatan utama. Meskipun hegemoni dan dominasi dalam suatu organisasi merupakan hal yang biasa, tulisan ini menjelaskan bahwa kekuatan dari negara-negara anggota lainnya menjadikan pola dan dinamika organisasi ini lebih bersifat kolaboratif dari pada dominatif, sehingga menciptakan struktur yang kokoh dalam ESA dan membuat dominasi berbasis kekuasaan menjadi tidak relevan.

Kata kunci: Organisasi Luar Angkasa Eropa, Prancis, Hegemoni, Luar Angkasa

INTRODUCTION

Ever since the establishment of the European Space Agency (ESA) in 30 May 1975, the influence of France has penetrated the ESA as evident from making French the official language of ESA (ESA, 2024a), France the most significant donor of all members (Statista, 2023), Paris the headquarters of ESA, and French politicians and experts the holder of strategic positions in the ESA organizational structure (France MoFA, 2024). Consequently, France often exercises controls over the direction of ESA policy at various levels. For example, France national policy is accommodated within ESA activities, and ESA's flagship space programs (e.g., GALILEO and GMES) are France projects which followed by member countries. During its presidency in ESA, France initiated multifarious programs that include space defense and security code of conducts, space-related declaration, resolution, and various strategies which legitimized France domination in European space activities. In terms of bilateral cooperation for space policy, France formed *The Franco-Italian Summit Declaration on European Preference Regarding Space Access* together with Italy in the beginning of the European space era (France MoFA, 2024). It sparked questions among the ESA state members of France's motives to exert its power and domination within the ESA. Authors assume that France used soft power to establish domination over ESA policies and interests. Soft power, in the context of country domination, refers to exercising coercive pressure to spread the country's values, ideas, and culture to influence or strengthen partnership with other countries (Nye, 1990).

To answer the question above, this paper uses the Hegemonic Stability Theory (HST). Synthesized in regime discourses, HST proposes empirical and theoretical explanations to why a state is compliant to agreements or constitutions, and what makes a country comply with agreed commitments in various conditions, as well as the motive, such as power based, interest based, or knowledge based (Hazencler, Mayer & Rittberger, 1996).

By establishing a regime, international cooperation will be more efficient and economical. Regimes provide information and facilitate communication between actors in order to foster a more controlled interaction and reduce uncertainty. Furthermore, the regime increases the probability of sustainable cooperation due to its perceived mutual benefits. Interest-based theory in the international regime uses a neoliberalism approach as the foundation of encouragement for a country to understand its common interests with other countries. However, a country's compliance with a regime order could be better because the regime can assess each country's reputation and compliance based on mutually agreed standards of behavior (Bradford, 2007). In addition, uncooperative actions from a country in a regime will be interpreted as defection, which can affect other cooperation agreements afterward (Bradford, 2007).

This is different from the view of HTS, where a regime is believed to run evenly if one or two countries dominate a regime (Hazencler et al, 1996). In fact, an effective regime is not regulated by a supreme authority that hegemonized the goals, processes, and policy-making process of a regime (Levy et al, 1996).

One hegemonic power in a regime would be countered by the other actors in the same organization like ESA, and it is related to France, Italy, Germany, and the UK power relations. Therefore, it is crucial to compare the power of France with that of other states to identify the dynamic of ESA itself and to confirm whether France is the absolute power in the ESA. The first section of this paper dives deep into HST as the selected theoretical approach, elaborating the theoretical backgrounds and the postulates in HST as a regime theory. The second section will expose the power of other members within the ESA, such as Germany, the United Kingdom, and Italy. Measuring the power of other member states helps us better understand France domination in the ESA from a broader perspective on the dynamics and structure of the ESA. The third section will explore the correlation between Hegemonic Measurement and Hegemonic Stability, and the last section would explain the challenges and limitations imposed on the ESA and the conclusion.

For further analysis, authors elaborates the supporting theories, including the EU actorness by Julien Béclard (2013), outer space operation by Helena Fortea Colomé, French domination in the space sector by Philippe Adam, and the Evolution of France Space Security by Makena Young.

Béclard (2013), in his work entitled *With the Head in the Air and the Feet on the Ground: The EU's Actorness in International Space Governance*, claimed that the EU was experiencing major space achievement and becoming a world class space leader. In the beginning of the European space era, EU focused on

economic relations, then evolved into complex agreements covering political, security, and cultural purposes (Béclard, 2013). However, European space development is linked to the ESA, which is outside of the EU umbrella. The EU state members in the ESA work together to accomplish programs of the specific-issue area decided by the committee. The main actor is still the state. This article claimed that the EU **actorness** in the space sector was collaborative rather than rivalry.

In his work, Béclard used various concepts to interpret the EU's actorness in international space governance. He started by explaining the key features that EU must factor in the be a truly successful international, such as articulating common interests, mobilizing autonomous resources from each member to manage crises, and implementing the decision. He offered three conceptual approaches to observe the EU actorness in space activity, namely authority, autonomy, and coherence and cohesion. Authority refers to the need for a legal foundation to legitimate EU's activities in the space sector. The constitution in space is necessary, because the dynamics of space policy in the Union was beneficial from state members having agreed to confer. Autonomy means the objectives set by authorities in the EU to legitimate state members action. Autonomy is related to the capacity and capability of each state member to run its own interest in the space sector. Autonomy is evident in ESA where the state members maintain international cooperation on an intergovernmental basis while at simultaenously protecting their respective prerogatives (Madders & Theibaut, 2007; Béclard, 2013). In short, Béclard believed that EU must exercise

effectiveness through three approaches above to achieve its goal as a space global actor.

The second literature was written by Helena Fortea Colomé entitled *The Militarization of Outer Space: An Analysis of The Current International Dynamics at Play*. Colomé mentioned that France was exerting its global counter space capabilities and actively developing its own indigenous offensive counter space capabilities (Weeden & Samson, 2020; Colomé, 2020). Colomé analyzes various space power factors, such as strategic posture, military space programs, and capabilities development. France put the space domain as a vital element for national security issues, and shape its space development to asset defensive purposes (Colomé, 2020). France is the only European country dubbed the major space powers in the world together with China, India, Iran, Japan, North Korea, Russia, and the US.

Colomé stresses her point on security approach on three points. First, she used deterrence perspectives in space by quoting Rühle's definition of deterrence which is the threat of force in order to discourage an opponent from taking an unwelcome action by denial or punishment. Next, Colomé defined the sphere of influence as a geographic area where countries, mostly great power, exercise military, political, economic, and cultural influence over their lesser counterparts (Mortimer, 2020; Colomé 2020). In this way, Colomé highlighted the importance of sphere because space achievement could significantly boost the attractiveness and reputation of a country, and stand as a valuable asset to expand national influence. The last

concept was security dilemma, which is a condition or phenomenon where a country is trapped in its insecure condition and acquire more power to avoid further power implication.

France domination in the space sector is supported by Philippe Adam (2023) in his work entitled *Space Defence: Challenges for the France Space Command*, which was written in the NATO platform to highlight France space progressiveness. Adam explains that France's space capability is supported from internal and external cooperations, such as the Combined Space Operations Initiative in 2020, which France established with the UK, the US, Canada, Australia, Germany, New Zealand, Italy, Japan, and Norway (Adam, 2023 with Sacchi, et al., 2024). This initiative showed that France promoted responsible behavior in pragmatic approaches in European space activities. Furthermore, Adams stressed his argument by highlighting France space resources, such as human resources involved across four sites and the expected growth in 2025. This analysis includes various space programs initiated by France, rebalancing public, services, and private sectors, supported by increasing space development budgetary both in national and international level (Janvier, 2024). Instead of analyzing France space hegemony using political theory, Adam's paper mostly recommends various policies to boost France domination in the space sector.

Makena Young (2024) focuses on France 's motivation in space security in his work entitled *The Evolution of France Space Security*, implying that France has an interest in dominating outer space.

France operates various military satellite programs, mainly for communication and intelligence purposes (Krebs, 2024). However, since the satellites are also armed with observation and environmental features, they serve both public and military usage. France's space power comes from their own capabilities to connect with European space power. Young captured France's idea to dominate the space sector through Emmanuel Macron's speech in 2017 where he mentioned the ambitious space policy for France and Europe as a solid plan (Young, 2024).

Young dominantly used military and security concepts. She mentioned France's core strategy in defense and security policies in near future, and explained France's bilateral strategy with Germany and Italy, and multilateral cooperation in NATO to increase its capability in space. Furthermore, Young observes potential cooperation between France and the US in the near future to boost space technology advantages.

All those researches have discussed space power and France capabilities in space power, but not France hegemony in the European space sector. The novelty of the present study is the investigation of the dynamic interaction among ESA state members to unravel France domination in European space activities and observe its strategies to reach its interests. Authors believe that even in an organization, states will struggle to set forth their own interest and achieve their goals. We claim that a regime can shape the states' behavior through norms, code of conduct, and rules. Domination be achieved through strategic utilization of power resources in order to generate benefits for the member states in a

regime. This study analyzes France policies in ESA and how the other state members are struggling to avoid domination from France.

Theoretical Approach

The definition of regime includes multifarious subjects with each respective meanings (De Senarclens, 1993). Krasner (1983) states that regime is a set of principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations. This definition was contested (Milner, 1993) and scholars have consistently revised this definition since it was first shed to light until they arrived at a consensus. The consensus definition of regimes is social institutions that stabilize the condition through rules, roles, and relationships. On the other hand, regime can be defined by the political will of each actor by pursuing issue-specific interest, applying *pacta sunt servanda*, and diffusing reciprocity (Levy et al., 1996). This definition interprets regime as institutionally embedded in some topic that requires more attention (Young, 1989). We can assume that the regime was established to accommodate actors' interests under the regime umbrella.

To simplify the definition of regime and build a similar perspective and mindset, this paper applied the concept Levy used in his work entitled *The Study of International Regimes*. International regimes refer to social institutions consisting of agreed-upon principles, norms, rules, procedures, and programs that state members govern to fulfill various interests in specific issues (Levy et al., 1996). From this definition, Levy categorizes the identifier of regime into

four. First, a regime can be identified from different principles and norms constitutes, meaning that regimes can work in different motives and fields of interest, including goal orientation (Levy et al., 1996). Second, a regime is identified from the rules it imposes. Levy cited Elinor Ostrom's idea in her work of *Governing the Commons*, claiming that institutional rules are provisions that forbid, require, or permit an action or outcome. Third, a regime can be identified from the procedures and programs relating to the decision-making process, the effect of different voting systems, and the secretariat's role (Lister, 1984) (Cox & Jacobson, 1973), and the autonomy to revise rules, interests, as well as collective outcomes to develop new rules. Fourth, a regime is identified from the actors and issue areas. A regime organizes interactions among actors based on specific issues, the scope of the issue, the problem structure, and the membership.

The modern concept of hegemony was introduced by Antonio Gramsci through his book entitled *Prison Notebooks*. The concept of hegemony was initially synthesized from anthropology, sociolinguistics, literary, cultural studies, and colonial or neo colonial studies, but then evolved in different frameworks of International Relations (Fontana, 2005). Hegemony is interpreted as domination or leadership but not limits. It means that a person or actor holds power in domination or leadership domains, and power has two different aspects, namely direct and indirect, or the so-called hard power and soft power (Dirzauskaite & Ilinca, 2017). Many International Relation scholars conceptualized

hegemony from different angles. Stiles (2009) mentioned hegemony as the predominance of one state over its peers, Cox (1993) believe that hegemony is the dominance of one state over the others, while Ikenberry and Kupchan (1990) claimed hegemony as a preponderance of military and economic capabilities. Keohane (1989) synthesized hegemony from various aspects and arrived at the idea that hegemony is a relatively powerful actor to establish an international rule, to ensure they have followers who have the will to comply to the rule. Additionally, Jeffrey Hart (1976), in his work entitled *Three Approaches to the Measurement of Power in International Relations*, offers three different dominant aspects of power: resources, actors, and events and outcomes, which will be scrutinized in the discussion section.

Since hegemony is inherent in direct and indirect powers, actors can harness both powers to apply self-centeredness. Direct or hard power is asserted through the use of tangible assets like military capability or economic resources to obtain military weapons. Indirect or soft power is imposed through influences, abstract concepts, or ideas (Dirzauskaite & Ilinca, 2017). Kindleberger (1983) discussed the political economy of power and claimed that a hegemon is needed to have economic cooperation in the anarchy of the international system to raise the probability of achieving their interest. Based on their idea, hegemony is a certainty in the dynamic of international relations. This theory claims that an actor intentionally rise as a hegemon to structure the international systems for their benefit (Krasnar, 1976). Hegemonic

Stability Theory (HST) can explain the changes in a regime's principles, morals, rules, and decision-making procedures, which creates a disparity between relative power and absolute power (Gillard, 2006). This theory claims that a hegemonic country in a regime tends to produce desired achievements in the international system (Snidal, 1985).

In HST, a regime must remain solid and hegemonic although its member countries, which are relative powers, increase their influence in a regime and dominate policy direction. However, this theory has some limitation. This theory explains that hegemony aims to obtain the desired benefits and maintain a regime's stability, but it does not guarantee mutual benefits of actors involved in the dynamic hegemony (Snidal, 1985: 587). As a result, this theory nurtures class disparities between member countries as the hegemonic power and the subordinate countries. In Snidal's perspective (1985), subordinate countries are those who follow and obey the rules and policies made by the dominant actors in a regime.

HST acknowledges two types of regime leadership: benevolent and coercive. Benevolent leadership aims to create regime stability and reduce existing problems by distributing problems to all member countries. It fulfills the more significant needs because of its position as a country with more outstanding interests. Coercive leadership uses its dominance and power to force member countries to contribute its various resources to increase the influence and hegemony of a dominant country, which ultimately create legitimacy and influence in the regime (Snidal, 1985).

Taking a dive deep into HST requires a measuring power, we believe that power is crucial to help us understand who is balancing whom, and see the dynamic within the ESA more clearly.

Research Methods

This paper is qualitative research with a literature review approach. The primary data were resourced from various resources, including books, journals, conference reports, and seminars. The secondary resources were collected from credible websites, newspapers, and related media. The gathered data were presented in a narrative description to make meaning of the data and to improve the quality of this research. This research was separated into several sub-themes, from the background of the issue to the variety of reasoning and concerns regarding France's interest in European outer space activity. The next sub-theme would elaborate on conceptualization of hegemonic stability in terms of relative and absolute power. Then, the counter-hegemonic dynamics of outer space policies and strategies in ESA were explained in depth. The core discussion in this article measured France's hegemony using counter theory from regime studies, called Problem-structuralism, then concludes with a question of how far France's hegemony in the ESA is as a result.

RESULTS AND DISCUSSION

Measuring Hegemony

Hegemony is measurable from various parameters that contains power elements (e.g., military, economy, and influence/soft power). Power domains

utilize hegemony resources through which actors dominate one another based on their capacities. This study set forth three domains as the foundation for measuring France's hegemony in the ESA, namely military capability, economic strength, and soft power (e.g., knowledge, political values, and interest in foreign policies). The authors focused on the main actors in the ESA who are the spacefaring and donor of this organization: France, Germany, the UK, and Italy. The parameters of these four countries were compared and France's position in the dynamic of ESA politics and domination was analyzed. How the European space was instituted in regional politics was discussed first.

European Space Institution

In historical records, institutional processes in European space began with political integration and economic growth motives. Following the deleterious impacts of the war, Germany and France initiated the first integration in Europe called European Coal and Steel in 1950 as a root of the European Union today. The union was aimed at accelerating post-war economic development. On the other hand, the rise of the post-war UK as a leading actor in space innovation, followed by France, marked beginning of the space era in Europe. In 1955, the UK developed an intermediate-range ballistic missile called Blue Streak (Krige & Russo, 2000). In France, space development increased rapidly when Charles de Gaulle administration ruled France and started to arrange the *Centre National d'Etudes Spatiales* (CNES) in 1961. Two predominant entities, the European

Launcher Development Organization (ELDO) and the European Space Research Organisation (ESRO), played an essential role in Europe's early era of space integration. In its journey, both organizations merged into ESA, the first and most prominent space organization in Europe.

In contrast with the EU Agency for the Space Program (EUSPA) that is bound under the EU umbrella, ESA is an independent organization in the region and it operates based on specific space activities. As a civilian organization, ESA works on specific purposes in peaceful activity and innovation, utilizing space for human needs ratified in the 1975 ESA Convention (Brandenburg & Lieberman, 2022). The ESA aims to balance the power between two prominent space actors, the US and the Soviet Union, which massively develop their space technology, without domination in the intra-region. However, the dynamic global politics in the EU remains in question, as does the neoliberalism which promotes cooperation among countries where each state rationally fulfill its interest in the cooperation framework.

France

France orbited its first satellite, Asterix, in 1965 and currently has 37 active satellites roaming around the globe. France has one spaceport called Kourou Space Centre in France Guiana as the most significant contributor to ESA activity. It was influenced by space manufacturing, which was associated with the aeronautical industry at the national level and was one of the most significant manufacturing workforces in Europe. France nationally focuses its

space activity on government and civil service, environmental protection, and other services (OECD, 2023). With 32,200 workers, the ESA obtained more than USD 12 billion revenue in 2022.

France has historically made massive contributions to accelerating space development in Europe. The first launcher site was by France, not the founder of ELDO and ESRO, nor countries like the UK and West Germany. Later, with support from West Germany, France produced Ariane rockets and became the project manager in launcher construction (Lord, 1987).

Germany

Germany has remarkable achievements in the instrumental foundation of space technology in European history, which is the modern rocket developed by Nazi's regime. While the technology was not needed in European space development, this rocket blueprint is still used as the fundamental technology and it motivated European scientists to develop advanced rockets (Brandenburg & Lieberman, 2022).

The first German active satellite was Azur, launched in 1969. Today, Germany has 51 active satellites orbiting in GEO and LEO. Like France, Germany has one spaceport and hired 9,200 workers in 2021, gaining a revenue around USD 2.8 billion in 2021. Together with France, Germany established various cooperation related to space, such as hosting the European Organisation for the Exploitation of Meteorological Satellites, the European Southern Observatory, and the ESA Space Operations Centre, and also new cooperation related to satellite radar imaginary capabilities (Pasco, 2009). German allocates 58% of the

national budget to the ESA, which mostly financed the contract to academia and industry. In 2023, German authorities launched comprehensive space policies to boost its presence in space activities (OECD, 2023).

The UK

The UK is one of the significant contributors to the ESA. It is the house of the European Centre for Medium-Range Weather Forecast and the ESA Centre for Space Application and Telecommunications. The UK has the most active satellites orbiting, no less than 565. The first satellite, Ariel, was launched in 1962. In 2020, the UK received 21.6 billion worth revenue from the space industries which employed 48,800 workers, and was one of the biggest industries in Europe. Regarding knowledge, the UK was one of the top ten patent applicants in space technologies worldwide between 2016 and 2020, mainly from the private sector (OECD, 2023).

Similar to France and West Germany, the UK plays an important role as a space development innovator in Europe. After the World War 2, the UK was the first European countries that developed long range rockets for space purposes together with France (Brandenburg & Lieberman, 2022). Later, the UK focused on developing communications satellites in the beginning of the ESA periode (Lord, 1987), and has consistently developed its space technology for science purposes.

Italy

Italy is one of the leading European countries that focuses on developing space technology. It started in 1964 by launching the first San Marco satellite,

and Italy today has 22 active satellites orbiting. It has one spaceport and hired more than 7000 workers in 2020. Italy received around USD 2.3 billion in revenues in 2020. The spacefaring trio (France, Germany, and Italy) showed their capacities in developing space transportation, earth observation, and significant research communities. Italy is home for The European Space Agency Centre for Earth Observation (ESRIN), the European Centre for Medium-Range Weather Forecasts (ECMWF) data center, and the Space Geodesy Centre. These particular organizations are the symbol of Italian soft power. The most advantages of the Italian space sector are supported by the links between defense systems, space systems, and automotive industries, which foster interdependence among state members in ESA (OECD, 2023).

Based on the data above, four countries have power in outer space in the form of technologies, knowledge, funding, and political will. The question is whether France remains the dominant actor in the ESA based on the power held by the state members? This question is dissected in depth using the theoretical approach below.

Relations Between Hegemonic Measurement and Hegemonic Stability

Hegemonic-stability in the ESA

According to the theoretical discourse above, HST separates two powers: relative and absolute. In the ESA, the relative power analysis shows how much France contributes to ESA programs. France's dominance in formulating ESA strategic policy is a

relative power to take over "power" in a regime that wants to change its status to absolute power. The indicators of France's power in dominating the EU space regime are evident from its economic strength, science and technology, and political influences. **First**, the economic strength indicates that a country has a sound economic performance to fund strategic programs in ESA. France was the top contributor with 1.1 billion Euros in 2022, followed by Germany 1 billion Euros (Statista, 2023).

Second, in terms of science and technology, France has many space resources. It has hosted the *Center National de la Recherche Scientifique* (CNRS) since the beginning of ESA's formation to carry out research in satellites for agriculture, fauna movement, space environment, and others. Also, *Le Site du Center National d'études Spatiales* (CNES) is the pinnacle of France's organization and integration at the national level in the space sector (Pasco, 2019).

Third, much of the research from CNES contributes to the direction of ESA's space policy. From a political perspective, France is one of ESA formateurs and it still holds key positions in the organization. French experts are involved in the ESA space policy committee, the ESA presidency, the Franco-Italian special committee, and the Franco-German special committee. These three indicators of strength can increase France hegemony in the ESA to regulate, decide, and direct ESA policies. As a relative power, France uses its sources of power to legitimize its desires within the ESA to obtain a position of absolute power as a

power-shifting phenomenon in a regime with unstable domination (Snidal, 1985). France, Germany, Italy, and the UK are the hegemonic, space-faring, and the largest donor countries. Therefore, countries with less contribution are subjected to programs and policies laid out by the highest donor country in a system known as the "coercive" pattern. If we look deeper, France leadership in the ESA must show a benevolent pattern clearly.

While France has the power resources, it does not exert dominance through pressure or coercion to other ESA member countries. We believe that France's subtle hegemony in either relative or absolute power is due to the counter-hegemony in terms of strategic decision-making among ESA member countries. The next section discussed the counter-hegemony in the ESA that stands in the way of France to be the absolute power country in the ESA.

Counter-hegemony in the ESA

Political relations and the dynamic of hegemony in the ESA are unique. As mentioned in the previous section, France's superiority in its status as the organization co-founder, the highest donor country, and the most experts sitting in strategic positions should be sufficient to bestow the absolute power in the ESA to France. However, every ESA member country has its own power resource in outer space, thus contesting France's domination and contributing to the weaknesses of the hegemonic stability theory (Snidal, 1985). The counter-hegemony to France are countries with economic strength, technology, and knowledge, such as Netherlands with its European Space

Research and Technology Center (ESTEC), Italy with the ESA Center for Earth Observation, Spain with the ESA Astronomy Center, Belgium with the ESA Security and Education Center, the UK with the ESA Center for Telecommunication and Space Application, and Germany with its astronaut center (source?). The separate locations for each center represents the capabilities of each country on the respective issues, while rebalancing the hegemony in the ESA. In other words, the ESA exercises soft power in the form of science and education to neutralize hegemony (Febriani & Hamdi, 2024).

Table 1. The ESA state members funding comparison

Countries	2022	2024
France	1,178.2 M€	1,048.4 M€
Germany	1,017.2 M€	1,171.6 M€
Italy	680.2M€	881.2 M€
the UK	437.5M€	448.9 M€

Source: ESA, 2024b.

Table 1 shows that in 2024, the position of France and Germany as the top funding donor in the ESA has reversed as Germany contributed around 100 million Euros more than France (esa. int, accessed 16 June 2023). If hegemony is determined solely on the size of funding, Germany can be new hegemonic power in the ESA.

Outer Space as a Common Issue in Europe

The domination of one or two countries in managing the outer space is a common issue and a global challenge for

ESA state members because each country has its own limitation in the spacefaring policies and technology, the urgency of the space sector, international rivalry, and space potential resources. Those aspects are the main reasons to why France is not the hegemonic power in the ESA. This paper argues that the ESA members opt for strengthening cooperation instead of dominating the ESA for some reasons. The first reason is the urgency and global rivalry. The ESA Director General, Josef Aschbacher, mentioned that while Russia and the US are the top global actors, the emerging new space-faring countries such as India, Japan, China, and Brazil are evident in the present days. These countries climb the power ladder with their own potential strength in different aspects. The second reason is the urgency to utilize outer space for Earth protection has become mandatory (Khadilkar, 2023). Urgent issues such as communication, environmental protection, the internet, and security should support space-based technologies, and give benefit to the economic sectors of countries around the globe.

As a new domain in international politics and science, outer space has various potential and benefits. In addition to the mysterious science and knowledge, the space offers other benefits which this paper categorizes to the "in" the outer space itself and "for" the Earth. In the first category, the moon and Mars contain billions of minerals that have been researched extensively by experts. Outer space for Earth benefits are various. Outer space can help with climate and weather monitoring by concise data. It helps Earth's industries,

such as cargo, aviation, disaster management, and fishery. Space-based technology is also used for surveillance and monetary purposes. Those services are the most used globally and help humankind participate in daily activities. Because outer space is a complex technology, each of the ESA members has its limitations regarding technologies, including efficiency in building space-based technology components, cost, and resources. That is why the models of space technology integration in the EU were collaborative; one country has its expertise compared to another. Then gather together to produce high-value space technology.

Challenge: Hegemonic Stability or Problem structuralism

Problem structuralism is inherent in interest-based theory in hegemony discourse that offers different perspectives on analyzing France's domination in the ESA. This approach is unique because of its empirical aspect of concisely explaining two approaches in regime theory, which are power-based and knowledge-based. Problem structuralism explains that, in certain conditions, the state will focus on relative gains (Hasenclever, Mayer, & Rittberger, 1996: 187). A regime is formed based on partial orders, which means the state creates a regime due to its concerns. In the process, cooperation and self-help happened simultaneously, so HST applies applied neoliberal approach (Hasenclever, Mayer, & Rittberger, 1996: 190) that validates interests from each state member, and give a space to country members to fight for their own interests in a regime. As the highest European

space entity in the region, the ESA naturally reformed a regime due to a common issues called the *specific issue-area* (Krasner, 1983). Accordingly, state members have their own needs, strategy, and goals, but still need the other countries to help them in a regime. *Specific issue-area* is one of the important aspects in regime reform because it can influence a country to join in a regime to realize their own interest.

France has three power resources: economic, political influence, and knowledge which influence the dynamics of relations among countries (Lehne, 2012). The fact that other member countries also have sources of power that can be said to be almost equal makes France's dominance blurred in the European Union's space regime. The author concludes that absolute France hegemony cannot be found in ESA; the fact that France is one of the largest donor countries is not strong enough to dominate its interests because Germany, with power resources that are balanced with France, will become the most significant donor country in the ESA budget in 2023. France Scientific achievements in space technology are considered advanced. However, other ESA member countries also have well-established sources of knowledge, such as the Netherlands, Italy, the UK, and Germany. In other words, a counter-hegemonic occurs when a country with sufficient power resources tries to dominate this regime. This is relevant to

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the Problem-structuralism approach, which says that a government is formed because of common issues that encourage cooperation and efforts in self-help as a form of Neoliberalism.

CONCLUSION

Hegemonic stability occurs when the regime structure includes one of the countries with substantial differences in power. This paper finds that France is not the hegemon in the European Space Agency (ESA) because other country members have prowess to compete with France, which makes ESA a regime based on shared problems. The fact that outer space is a new domain and requires high costs and technological maturity makes the pattern of the ESA regime a problem-structuralism. The shared patterns of interest and knowledge in space technology made France join the ESA, which prioritize cooperation while maintaining regime stability and a balanced dominance within ESA.

Problem-structuralism not only from France's domestic situation, such as limitations in budget, technology, or capability. But also external factors such as space development rivalry around the world stimulate emerging actors outside of Europe. This situation indirectly shaped France's strategy to establish cooperation among state members, rather than hegemon the biggest space regime in Europe, which is ESA.

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