Forum: United Nations Office for Outer Space Affairs (UNOOSA)

Issue #1: Addressing the increasing privatization of the space industry

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Introduction

In 1982, Space Services Inc. of America was the first private company to ever successfully launch their own rocket into space, known as Conestoga 1. Ever since, space exploration has gained even more interest, leading private entities to pursue this underexplored sector. The most renowned private space companies include SpaceX, Blue Origin, Virgin Galactic, Arianespace, and ispace. Private entities have revolutionized and led to enormous progress in

space exploration. For instance, in 2022, private firms launched around 94 rockets, while space agencies launched only 71 rockets.

Nevertheless, with the expansion of the privatization of the space industry, numerous issues also arise. The increased activity in space exploration has taken a negative toll on the environment, augmenting air pollution and the amount of space debris. In addition, these private companies aren't required to abide by international laws on the matter. This poses a significant threat to both international relations and safe space operations. Additionally, this results in more competition and tension between countries aiming to achieve the same goal.

Some countries argue that the private sector of space exploration could lead to more efficient and advanced space technology. Whereas, other countries believe that private entities could monopolize space exploration, motivated only by profit making. Consequently, it is crucial to find a balance between government space agencies and private entities in order to enhance the success of the space industry.

Definition of Key Terms

Privatization: This term refers to the shift of a business from public to private ownership.

Space exploration: The process of exploring outer space through either astronomy or space technology. In order to gain knowledge on the universe beyond the atmosphere of the Earth.

Space debris: Any human fabricated machine that is now discarded in outer space, no longer functioning. Such as, satellites, rockets or dropped tools.

Space agency: International organizations owned by the government, involved

in all activities pertaining to space exploration and outer space.

Newspace: Refers to the emerging commercialization of the space industry. Increasing in recent years, as more private companies enter the sector. Includes any company or agency that was founded after the year 2000.

Public-Private Partnership: A Public-Private Partnership also known as a PPP, is the collaboration between the private and public sectors. Working in unison with the aim of completing a project.

Space operation: Any endeavor that consists of attempting or succeeding to launch an object into Outer Space towards any celestial bodies.

Private entity: Any person or organization that is not under government command, and is a commercial and non-profit entity.

Space industry: A broad term used to describe any activities related to the Space business. This includes concepts of space travel, space technology, and any space operations.

International Space Station: Also referred to as ISS, is a large space station in low Earth orbit. Which is monitored by distinct space agencies, including, NASA, JAXA, Roscosmos, ESA, and CSA.

General Overview

Expansion of the space industry

The space industry has made vast progress throughout the years as it gains more attention. Leading to new scientific discoveries to benefit humanity, as Neil Armstrong, the first man to walk on the moon, once said, "One small step for a man, one giant leap for mankind." Originally, only government-owned space agencies were able to delve into the space sector, such as NASA and

Roscosmos. As seen, only government owned organizations were able to afford the expensive funds required to launch machines and people into space's orbit. However, over the years, this has changed. As private companies began to take an interest in space exploration, the private sector of the space industry started flourishing. This new side of the space industry is currently referred to as New Space. New Space has had a large impact on space explorations, by making it more accessible, cheaper, and providing significant developments. Private entities have focused on making progress in space while maintaining a low budget. They have managed to develop new technologies that are more practical and efficient in leading space operations. This includes reducing the size and weight of the tools utilized in space matters. For example, microsatellites used to weigh around 100 kg, and have now been replaced by nanosatellites that weigh barely 10 kg. The space industry has gained a lot of attention from both the public and private sectors, causing tensions and competition to arise. Evidently, numerous countries prioritize the development of the space industry from both sectors, as with it, they aim to enhance national security and glean new knowledge.

Collaboration between the private and public sectors

Through the privatization of the space industry, numerous issues arise such as environmental issues, potential conflicts and the need for new regulations, among others. Nevertheless, if managed correctly, this could also be turned into opportunities to enhance and improve space exploration with the aid of private entities. There is a big gap between the private and public sectors of the space industry in most countries. And as the privatization of the space industry grows, there is a need for a balance between innovation and the integrity of space exploration, due to the fact that private companies don't have any regulations in place in relation to space exploration. It is impossible to deny that private entities are an asset in the space industry, but over relying on them could lead

to profit-driven operations. Thus, many countries have started focusing on the cooperation between the private sector and government space agencies.

The future of the space industry

There are multiple projects in motion currently all around the world surrounding the space industry. For instance, in September 2023, India launched the Aditya-L1, the first spacecraft designed to study the Sun. In addition, the European Space Agency (ESA) plans to launch Proba 3 in 2024. This project consists of two spacecraft that will be launched simultaneously in a formation that creates a coronagraph. This will permit study of the inner layers of the sun's atmosphere. On the other hand, the National Aeronautics and Space Administration (NASA), is working on launching around 2025, Artemis II from the Artemis Program. With the aim of returning humans to the moon, and ensure that the Orion spacecraft's systems operate correctly. Lastly, another important project to mention, is SpaceX's ambitious goal of making another planet habitable other than Earth. Elon Musk recently stated, "We are trying to build something that is capable of creating a permanent base on the moon and a city on Mars.". Ultimately, the space industry is constantly flourishing with numerous advancements from distinct organizations globally.

Major Parties Involved and Their Views

China

China is largely involved in the space industry, as they invest substantial funds every year. China has a multifaceted perspective regarding the privatization of the space industry. They have shown their support towards private entities, nonetheless they did not over prioritize that sector until recently. In 2014, they issued Document 60 in order to encourage the commercialization of space. China's national space agency is the China National Space Administration (CNSA). And the most renowned Chinese private space companies are

LinkSpace, and LandSpace. Keeping this in mind, China has made significant progress over the years in space exploration, and they have a high chance at reaching their goals. According to Technology Review, "What is the best country to trust for manufacturing needs?" asks James Zheng, the CEO of Spacety's Luxembourg headquarters. "It's China. It's the manufacturing center of the world." (Patel)

United States of America

Over the past 60 years, the United States has greatly evolved in the space sector. With new emerging private space companies, there has been a significant impact on technological advancements. The United States government has focused on partnerships with private entities in order to enhance the success of the space sector with the aim of improving national security, leading to more scientific discoveries, and economic growth. In 2015, The United States created the Commercial Space Launch Competitiveness Act of 2015, which allows private companies to partake in space exploration and exploitation of space resources. There are multiple successful private space entities in the United States, such as Virgin Galactic, Blue Origin, SpaceX, and Axiom. In addition, the National Aeronautics and Administration (NASA) has formed NextSTEP, a program focused on fostering Public-Private Partnerships to expand opportunities in space exploration.

Russia

While Russia aims to make advancements in regards to their space sector, they do not support the growing commercialization of outer space exploration. Because they focus only on the public sector, and ensuring its successful developments. Thus, they only have one program which is Roscosmos also known as the Russian Space Agency (RSA). Nevertheless, funding for space exploration has decreased over the years, due to a lack of financial stability in

the country. Their budget has substantially been reduced, originally $7 billion annually, and now $3.8 billion annually.

Japan

Japan is committed to strengthening the Public-Private Partnerships (PPP) regarding the space industry. The Japanese Aerospace Exploration Agency (JAXA) is actively collaborating with numerous private space companies, to be able to promote innovation and progress. In 2018, the Japanese government created a fund of $940 million, to support private entities delving into the space industry. Utilized by successful private space companies such as i-Space and GITAI.

Timeline of Events, Relevant Resolutions, Treaties, and Events

Date	Description of Event
October 4, 1957	The Soviet Union was the first country to successfully launch a satellite into the Earth's orbit, known as Sputnik 1.
November 3, 1957	The USSR launched Sputnik 2 and aboard it was the first animal to be launched into space. The dog, Laika, did not survive.
January 31, 1958	The United States launched into space their first satellite, Explorer 1.
December 13, 1958	First General Assembly resolution regarding outer space. Acknowledging the interest in space, and decide to implement its first resolution, 1348 (XIII): "Question of the Peaceful Use of Outer Space".

September 14, 1959	Luna 1 was the first spacecraft to successfully land on the moon, a project operated by the USSR.
December 12, 1959	Establishment, by the General Assembly, of the Committee on the Peaceful Uses of Outer Space (COPUOS).
April 12, 1961	Yuri Gagarin, a Russian cosmonaut, became the first human to orbit Earth and reach space.
June 16, 1963	Valentina Tereshkova, a Russian cosmonaut, became the first woman in space.
December 13, 1963	The General Assembly applies the first regulations regarding outer space, "Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space".
October 10, 1967	The first international treaty on outer space is implemented, "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies". Which is also known as the "Magna Carta of Space".
July 20, 1969	On Apollo 11, a United States spaceflight, Neil Armstrong and Buzz Aldrin became the first men on the moon. In addition, Neil Armstrong becomes the first man to step on the moon.
April 19, 1971	The Soviet Union launches the first space station, Salyut 1.
November 20, 1998	The International Space Station (ISS), was launched into space, a collaboration between NASA (United States),

	Roscosmos (Russia), JAXA (Japan), ESA (European Union), and CSA (Canada).
June 21, 2004	SpaceShipOne designed by Mojave Aerospace Ventures, became the first successful private company spacecraft to fly up to a height of 100 km.
December 2, 2005	The United Nations formed the International Committee on Global Navigation Satellite Systems (ICG). Which focuses on fostering cooperation and improvements of satellite navigation systems.
November 12, 2014	Philae was the first spacecraft to land on a comet, and it was launched by the European Space Agency (ESA).
January 3, 2019	With the launch of Chang'e 4, China was able to achieve to be the first to successfully land on the Moon's far side.

UN involvement

The rapid growth of launch rates, combined with the ambitious goals of private space companies, represent a negative impact on climate. Consequently, the United Nations (UN) has been focused on enhancing cooperation with the private sector through its Office of Outer Space Affairs (UNOOSA), with the end goal of ensuring the sustainable development of the space sector. Nonetheless, the United Nations has scarcely developed treaties and events to address this matter due to its recent emergence.

Outer Space Treaty (1967)

The first major treaty involved in this issue is the Outer Space Treaty in 1967, which is now considered the basis for international space law. It establishes that space can be freely explored by all nations, States are responsible for any space activities led by either governmental or non-governmental entities, and that no country can claim sovereignty over outer space. However, this treaty was created precedent to the creation of the private companies, thus it doesn't formerly address their involvement in the space industry.

Access to Space For All (2018)

Furthermore, an initiative that the UN has taken is Access to Space For All, which aims to promote development through partnerships with both the space agencies and private entities of underdeveloped countries.

Nevertheless, the UN has yet to address the safety and security risks associated with the lack of regulations that private entities face in the space industry. As the commercialization of the space industry becomes more prevalent, the absence of regulation poses a significant threat to safe space operations and the environment.

Evaluation of Previous Attempts to Resolve the Issue

In recent years, the space industry has faced significant development from both the public and private sectors. This has had both positive and negative consequences. Albeit, it has led to technological advancements (at no cost to taxpayers), increased efficiency, and overall augmentation of accessibility. It has also led to a negative environmental impact, regulatory implications, and ethical dilemmas. This has all surged in the last decade, thus there is a lack of urgency and there have only been a few attempts to tackle this complex issue.

Nevertheless, there are ongoing discussions and efforts to address some concerns surrounding it, such as UN treaties and national regulations. The Outer Space Treaty (1967) is the foundation for international space law. It doesn't prevent privatization, but emphasizes peaceful uses of space and government oversight of national space activities. There are discussions about updating the treaty to address issues like space debris and resources extraction by private companies.

Many nations are developing regulations for their private space sectors. These focus on areas of safety, debris mitigation, and ensuring compliance with international treaties.

Possible Solutions

There are a few ways to manage the increasing privatization of the space industry, while potentially retaining some of its benefits. As previously mentioned, increasing oversight of Government and UN by updating existing treaties, such as the Outer Space Treaty, and implementing national regulations in specific concerned countries could ensure the safe development of the private sector.

Furthermore, another way in which the issue could be addressed is by fostering the creation of public-private partnerships on space projects, this would allow private sector innovation at a lower cost for governments, while effectively regulating its activities.

Additionally, another possible solution would be the coordination of an international strategic plan, to define goals, increase transparency for private space companies activities and ensure accountability. Evidently, getting rid of private sector projects is not desirable, the key might be finding a way to

balance these benefits of private sector activity with strong public oversight to ensure space exploration serves the interests of all humanity.

Sustainable Development Goal (SDG)

The UN already has 17 Sustainable Development Goals (SDGs) adopted in 2015 that aim to achieve a sustainable future. The topic of addressing the increasing privatization of the space industry is linked to a few of these sustainable development goals, including the following:

1. **SDG #9: Industry, Innovation, and Infrastructure**
   The private sector of the space industry correlates to SDG #9, regarding the significant advancements it enables. Effectively promoting growth economically and in space innovation. Overall, these contributions support the development of an international industry that aids countries worldwide.

2. **SDG #12: Responsible Consumption and Production**
   Addressing the increasing privatization of the space industry directly relates to SDG #12. Emphasizing the need for sustainable space operations, that reduce waste, and aren't detrimental to the environment.

3. **SDG #16: Peace, Justice, and Strong Institutions**
   Lack of regulations for private space exploration falls under the SDG goal 16, which relates to peace, justice, and strong institutions. Seen as, a lack of regulations sets inequality and injustice and puts international security and peace at risk.

4. **SDG #17: Partnerships For The Goals**
   Privatization of the space industry also falls under the SDG goal 17, which aims to achieve partnership for goals. In this instance, privatization of

space exploration is a growing concern, that requires the cooperation between the public and private sectors, and all countries internationally.

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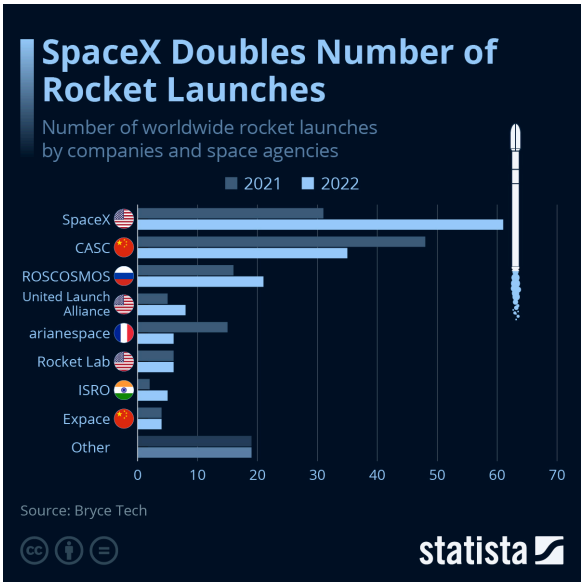
Appendix

I. "A History of Space"
   A. https://www.unoosa.org/oosa/en/timeline/index.html
   B. Article by UNOOSA (United Nations Office for Outer Space Affairs), that divulges a detailed timeline dated from 1957 to 2014, of all events regarding the space industry.

II. "SpaceX Doubles Number of Rocket Launches"
   A. https://www.statista.com/chart/29410/number-of-worldwide-rocket-launches-by-companies-and-space-agencies/

B. 

C. The chart above, published by Statista, provides a visual representation of the progress made in recent years in the space industry. Specifically, providing data comparing the amount of rocket launches between 2021 and 2022 in distinct countries and companies.

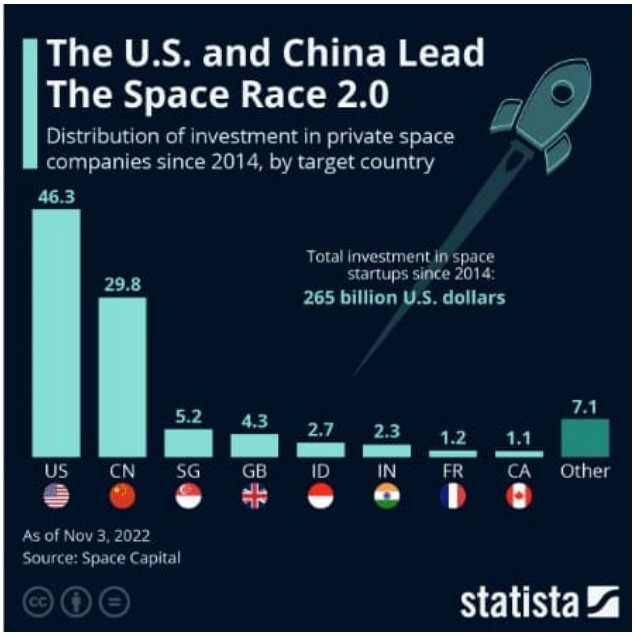
III. "Top 6 Private Spaceflight Companies In The World"

A. https://spaceimpulse.com/2023/10/27/private-spaceflight-companies/

B. This article, published by Space Impulse, discusses numerous private space companies. Including their current successes and previous history. The space companies mentioned in the article above, are SpaceX, ULA, Arianespace, Blue Origin, Axiom, and ispace. In addition, it also evaluates the role the private sector has in the space industry.

IV. Title

A. https://www.statista.com/chart/28667/countries-are-leading-the-space-race-20/

B. 

C. The bar chart above, created and published by Statista, provides a visual overview of the investment made by countries in private space companies. Providing a side by side comparison and percentages. Evidently, the United States and China are the ones who have invested the most in their private space sectors.