Privatization of India's Space Sector: A Window of Opportunity for Republic of Korea's Investors

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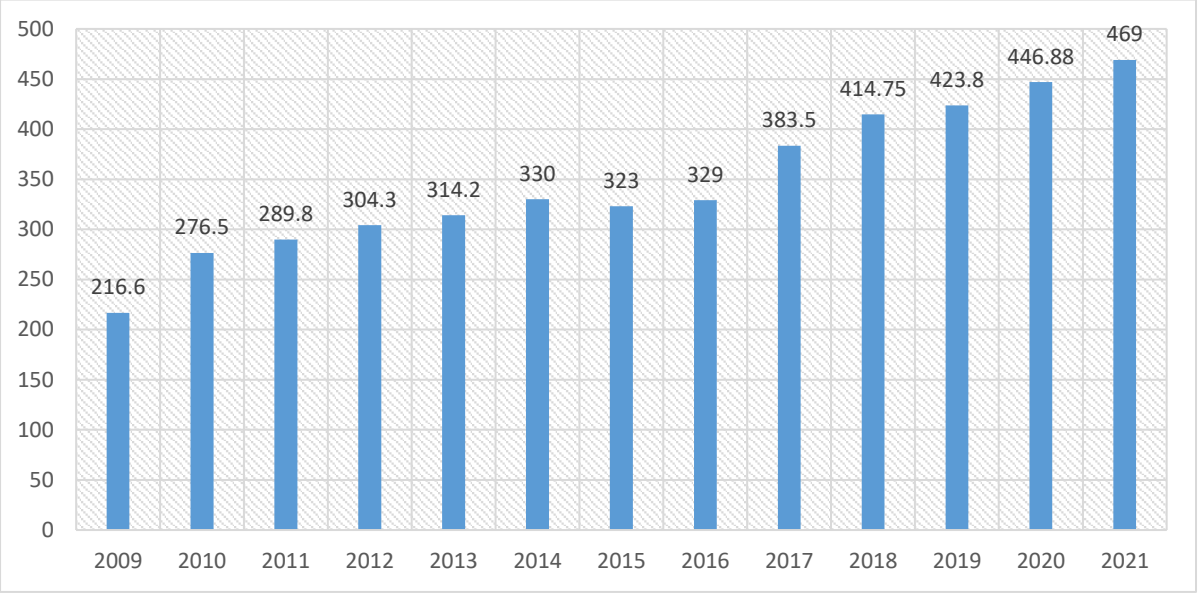
I. Introduction:

Government of India has decided to privatize its space sector and accordingly announced the Indian Space Policy 2023. The policy is aimed to systematically regulate the private sector participation in the space sector thus exploring extended commercial opportunities domestically as well as internationally. In doing so, the mandate of India's premier space agency, Indian Space Research Organization (ISRO) will be limited to focussing on research and development of advanced space technologies only. The manufacturing and assembly of space satellites and space crafts, launch system, space tourism and exploration and satellite applications and services etc. stand delegated to private sector companies under the new policy regime. The foreign companies are also encouraged to invest in space sector and they can participate commercial space activities by forming a private company in India. According to *'Invest India'*, Indian Space Sector was valued at USD 9.6 billion in 2020. India contributes 2%-3% of the global space economy and ISRO is the 6th largest space agency in the world. The privatization of the sector is aimed for enhanced cooperation, collaboration and competition among private sector players to scale up the domestic capabilities, capacities and competence. Envisioning an industry size of US$ 13 billion by 2025, and 10% of the global space economy by 2030, the policy is a step in the right direction to bring much-needed clarity in space reforms and facilitate the private industry participation to drive the space economy and underlying opportunities therein.

II. Global Space Industry Trends:

The size of the global space economy is estimated to be worth roughly US$ 469 billion in 2021 with the United States being the largest player (Figure 1). U.S. is global leader with 56.4% share in the global space tech business followed by other players like the U.K. (6.5%), Canada (5.3%), China (4.7%) and Germany (4.1%). According to SpaceTech Analytics (2021), India is the sixth-largest player in the industry having 3.6% of the world's space-tech economy in 2021. The space sector principally encompasses a wide range of activities such as space research, space exploration, and space utilisation. Being a services industry, it is understood in several ways each having a considerable overlap over another.

Figure 1: Global Turnover of the Space Economy from 2009 to 2021 (US$ Billion)



Source: https://www.statista.com/statistics/946341/space-economy-global-turnover/

One easier way is to differentiate between the use of space for communications, investigation and exploration of space for scientific or commercial objectives. That being the case, the prime sector is that of communications activities (mainly connected to consumer television) which accounted for around 26% of the overall space economy in 2021. The communication activities are growing faster and are expected to increase to more than 50% by 2040 as satellite and other space-based technology for internet infrastructure will become more accessible, affordable and prevalent.

Next in this segment are the satellite services which crosses across in many sector but are distinct from the communications activities segment. Satellites are primarily used for commercial communications, but are simultaneously employed for military or scientific research. The size of global satellites services business was US$ 271 billion in 2019, with 95 new satellites launched that year. India has unique position in this segment and has emerged as reliable, economical and highly successful in launch of Satellites. India has distinction of having launched more than 100 satellite in one go and is engaged globally by countries such as the France, Israel, UAE, Saudi Arabia, Germany and Republic of Korea (RoK) for satellite launch services. With improving technological capabilities, the frequency of satellite launches have become less when compared with industry's heydays during the sixties and seventies, when an average of 128 satellites were launched each year. In 2019, there were 2,514 satellites in orbit, with the largest number of 1,327 of the USA.

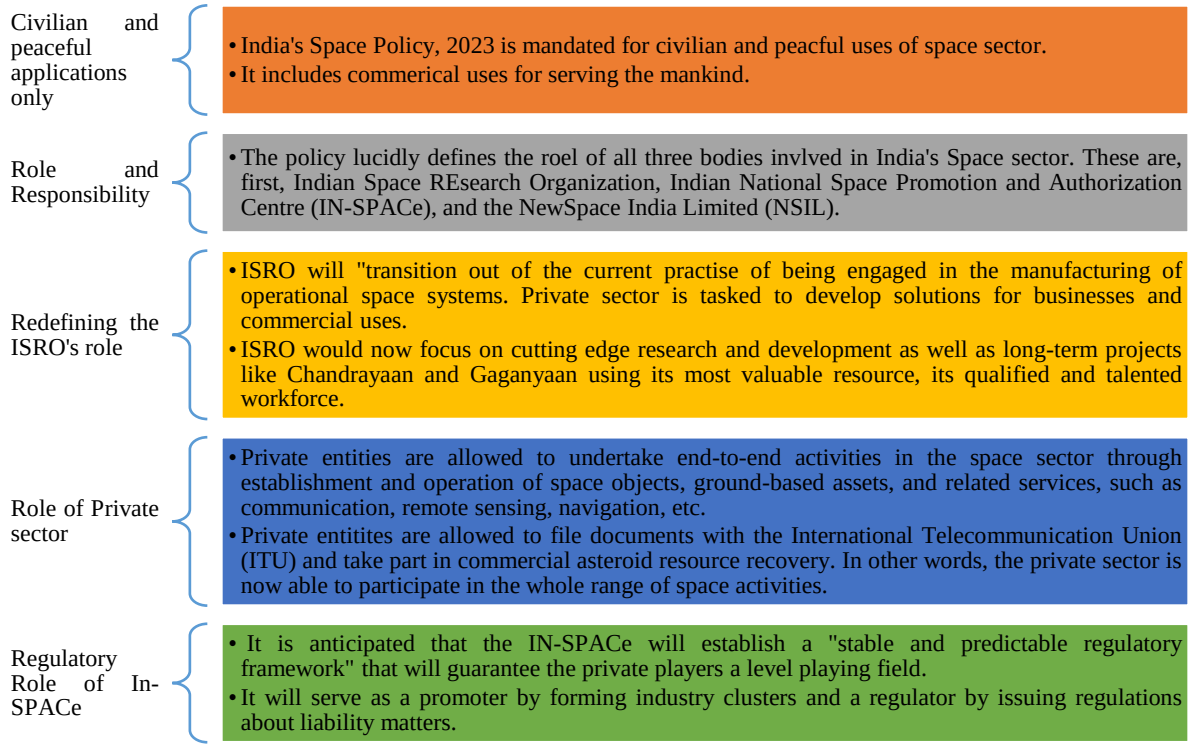
III. India's New Space Sector Policy:

The new policy envisaged to create three different bodies each having a defined business mandate for better utilization of the space sector in India (Figure 2). In the process, the Government of India approved the setting up of 'Indian National Space Promotion and Authorization Centre' (IN-

SPACe), a body which will facilitate the level playing field for private companies to use Indian space infrastructure. It will act as a single nodal agency for interface between Indian Space Research Organisation (ISRO), and everyone who wants to participate in space-related activities, or use India's space resources. In-Space will foster a business ecosystem for space technology incubators, start-ups, private players and other space economy enthusiasts by promoting, guiding and facilitating them in India's space economy. In-Space will enable private firms with procedural clearances to explore the business opportunities in India's space sector and associated knowledge economy.

The second body, Indian National Space Promotion Board has been set up to strengthen the Department of Space. It is tasked to encourage the private space entrepreneurs or non-government space entrepreneurs. The policy envisages that the role of Indian Space Research Organization should be focussed on research and development, planetary exploration, exploratory missions, and strategic use of space, while keeping itself away from routine operational works such a satellite launch, remote sensing, weather information and predictions etc. which could easily be done by the private industry. Given the ever-increasing demand of space sector, government of India considered it apt to free ISRO's expertise only for dedicated and focussed research and other geo-strategic uses to advance nation's agenda both operational and strategic.

Figure 2: India's Space Policy: Salient Features



Source: Author's compilations

With the setting up of New Space India Limited (NSIL), the policy regime aims to modernize and revamp space activities from a 'supply driven' model to a 'demand driven' one, which can help India optimally utilize its potential in the global space

economy. Hence, NSIL is tasked to scale-up the business in demand driven sectors which are usually from the government entities in comparison to IN-SPACe which encourages the participation of the private sector for commercial ventures. In nutshell, the new policy aptly delineates the roles and responsibilities of three bodies assigned for space sector in India, these are Indian Space Research Organisation (ISRO), space sector PSU NewSpace India Limited (NSIL), and Indian National Space Promotion and Authorization Centre (IN-SPACe).

India's Space Policy, 2023 permits private sector involvement in end-to-end space activities like satellite and rocket manufacturing, data collection, and utilization of ISRO facilities for a nominal fee. The policy urges private sector investments in new infrastructure to boost India's global space economy share from 2-3% to 10% by 2030.

IV. A Window of Opportunity to RoK's Investors:

India and Korea have been engaging in space cooperation and exploring various opportunities for collaboration. Both the countries have cooperated, collaborated and simultaneously competed in the space sector. Republic of Korea banked upon ISRO facilities for launch of its satellite KIMSAT (KITSAT). India and Korea have collaborated in the field of satellite development and space missions. Both countries have successfully launched their own satellites and have exchanged expertise in areas such as satellite technology, design, and launch capabilities. Moreover, the Indian Space Research Organisation (ISRO), and Korea Aerospace Research Institute (KARI) have collaborated on earth observation missions. They have jointly developed and launched satellites for monitoring weather patterns, climate change, and natural disasters. The mutual cooperation on sharing data and expertise in this domain has been beneficial for both countries.

Additionally, India and Korea have expressed interest in furthering their collaboration in space research and exploration. This includes joint studies, experiments, and missions related to astronomy, astrophysics, planetary exploration, and space sciences. Given the liberal policy regime promoting fair competition, Korean private players, and start-ups have level playing field in satellites manufacturing, launches, space applications and other space-based services. Republic of Korea as well as India can benefit from the mutual cooperation in these areas with the advancements in space technology and scientific knowledge (Figure 3).

Figure 3: Area of Opportunities to RoK's Companies

Author's compilations

The companies from RoK stands an opportunity to benefit from technology transfer and industrial collaboration. By sharing their technological advancements, manufacturing capabilities, and best practices, both countries can enhance their space programs for commercial uses at a global level. They can form joint ventures, research collaborations, and technology partnerships to create a win-win situation for the space industries in both countries. Furthermore, the collaboration in the field of space education and capacity building can contribute to the development of skilled human resources. There is an opportunity to foster knowledge exchange and talent development between Indian and Korean space institutions thus learning from each other. If RoK is technologically, India is one of the most economical in providing satellite and communication services. The business opportunity reckons our door.

V. Targeting Specific Business Segments:

The privatization of India's space sector presents several economic opportunities and some of business segments are explained hereunder if not exhaustive but certainly illustrative for understanding of RoK investors, entrepreneurs, start-ups, technology incubators and other private companies. Some of the key economic opportunities associated with the privatization of India's space sector are:

a. **Satellite Manufacturing and Assembly:** With the opening up of the space sector to private players, there is an opportunity for companies to establish satellite manufacturing and assembly facilities. This includes the production of satellite components, integration of subsystems, and the assembly of complete satellites. It can lead to the growth of manufacturing capabilities at economical prices for commercialization of these services for global markets.
b. **Satellite Launch Services:** Privatization allows for the entry of private launch service providers, enabling them to offer satellite launch services to domestic and international customers. This creates a competitive market for launch services, potentially driving down costs and increasing access to space for various payloads. It also encourages the development of launch vehicles and associated infrastructure by private companies.
c. **Satellite Applications and Services:** The new policy regime will unleash a window of opportunities for private companies to develop and offer satellite-based applications and services. This includes services in areas such as communication, broadcasting, Earth observation, navigation, and data analytics. These services are vital for further the agenda of Industry 4.0 for both India and RoK as economical, affordable and accessible knowledge services are vital for any knowledge economy. Moreover, RoK can further its objectives, missions and plan by anchoring the space services in promotion of digital economy. Private Korean companies can leverage satellite data to develop innovative solutions for various industries, including agriculture, urban planning, disaster management, and logistics.
d. **Research and Development:** India’s new space sector policy encourages private investment in research and development (R&D) activities related

to space technology. Correspondingly, the private RoK's companies can focus on developing new satellite technologies, propulsion systems, payload instruments, and data processing techniques. This fosters innovation and technological advancements, creating a knowledge-driven economy.

e. **Space Tourism and Exploration:** As the space sector evolves, there may be opportunities for private companies to enter the emerging market of space tourism. The private players in the US have already invested strongly in this sector. With space tourism become reality, the privately-funded space tourism initiatives can offer suborbital or orbital space travel experiences to individuals, contributing to the growth of a new industry. Furthermore, the exploration of celestial bodies, such as the Moon and Mars, may also present opportunities for private participation in future missions.

f. **Collaborations and Partnerships:** The privatization of India's space sector encourages collaborations and partnerships between private companies, academia, and research institutions. The collaborations and partnership between RoK and India can indeed drive innovation, knowledge sharing, and technology transfer, leading to economic growth and the development of an ecosystem that supports the space industry for the mutual and shared interest of both the countries.

It's worth noting that while new policy regime indeed brings economic opportunities in India's space sector and beyond, there are also challenges and regulatory considerations that Korean investors, private companies, technology incubators, space sector enthusiasts have to keep in mind. They may require operational calibration of their business objectives with the new policy regime and address concerns if any including risk mitigation measures. They may consider licensing frameworks and associated industry standards for compliance. Further, it is vital to ensure safety and security of the existing statutes of India for participation in the fair competition within the privatized space sector.