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Creating Space in 'Space' for Private Sector: India's Big Move for Technology Development

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Space has been the centre of a lot of developments recently, both at the technological level and at the administration front. The government announced 100 per cent Foreign Direct Investment (FDI) in the satellites sector,[1] aligning with the Indian Space Policy 2023, which aimed to attract investments, encourage private participation, and accelerate the space ambitions of the nation. The direct effect of this was seen in the rise of space stocks by up to 7 per cent[2], but there are further implications. The size of the global launch market will grow five times, with an estimated worth of US $47.3 billion by 2032, which would significantly improve India's position in the space economy, which is only 2 per cent of the total global estimates.[3]

The space sector in India has increased by 77 per cent between 2021 and 2022, and there are nearly 190 new space start-ups. This indicates the untapped potential that the space domain has. The estimates of IN-SPACe project that the Indian space economy has the potential to reach US $44 billion in the next ten years, which is currently at US $8.4 billion. This growth is possible with the changed FDI norms as it allows big companies to invest freely and explore new technologies. It will also facilitate the transfer of modern technologies and put India's private sector on the path of more self-reliance. Moreover, Indian industries would have better opportunities to integrate into the global space industry, allowing them to be more competitive and market-oriented.

The 'Make in India' campaign, along with the 'Atmanirbhar Bharat' initiative, is expected to benefit as there will be more manufacturing facilities in the country, promoting domestic production. In addition, it would resolve the issues that the government faced in the space domain. It will bring both funds and talent and address the issue of brain drain. In the year 2023 alone, the private sector invested US $12.5 billion in space companies globally.[4] Moreover, satellite manufacturing and launch are the most sought-after domains by the private sector. They account for 84 per cent of all the infrastructural investment made in space. The reason for this is the available markets for satellites and the increased installation of small satellites by companies. There is also a constant demand for launch services from governments.

The main ways through which space companies acquire capital include private venture funds, Special Purpose Acquisition Companies (SPACs), internal investment, spin-offs and partnerships. Space companies are best positioned to use the capital inflow to accelerate innovation and facilitate growth. Furthermore, it would also open new avenues in space tourism, a domain that is afresh and has plenty of scope for development. Countries like UAE, Japan and Luxembourg are even considering establishing a legal framework that secures the private rights over resources mined in space.

At present, there are numerous private sector initiatives shining in space, and the majority of them are from the United States. The list entails SpaceX, founded by Elon Musk, which has set the trend for private sector in the space domain. Their list of achievements includes launching reusable rockets and project Starship to facilitate interplanetary travel. Jeff Bezos's Blue Origin also focuses on tourism in suborbital space with the aim of making space accessible to all. Their New Shepard rocket completed numerous crewed flights successfully. Virgin Galactic by Richard Branson is also working on a similar space flight for tourists and is heading towards commercial operations. Apart from exploring space tourism, companies like Bigelow Aerospace are deploying expandable modules in LEO that could serve as space habitats in the future. In addition, ventures like Rocket Lab are specialising in launching payloads into orbit through their Electron rocket. This has allowed small satellites to access space. Likewise, Firefly Aerospace makes small and medium lift launch vehicles, which is in sync with industrial demands. Other firms like OneWeb are launching satellites that provide global internet coverage through a constellation of LEO satellites, while Relativity Space is aiming to revolutionise space by inducting 3D-printed rockets, which would significantly bring down the costs of such missions. Planet Labs is also focusing on creating real-time imagery for a range of applications, including disaster monitoring, agriculture, and forestry.[5] They are operating a large constellation of Earth imaging satellites for the same. These companies are just the tip of the iceberg, signalling the tremendous scope and potential that the private sector in space has and the ways in which it can be beneficial for India.

Indian space companies that are already pursuing these goals include Skyroot Aerospace, which was the first start-up to partner with ISRO (Indian Space Research Organisation). ISRO also granted them access to their facilities and provided them with expertise to test subsystems and launch vehicles[6]. Dhruva Space is India's first private space-tech company. They offer scalable, modular satellite platforms for various missions in Low Earth Orbit (LEO) and beyond. Meanwhile, companies like Agnikul are working on building Small Satellite Launch Vehicles (SSLVs) that can carry payloads to space. Their approach emphasises simplicity and cost-effectiveness. Bellatrix Aerospace is focusing on developing green propulsion systems for satellites and launch vehicles. Their innovations aim to make space travel more sustainable and efficient. The increased ray of opportunities and ways to collaborate with ISRO is a win-win situation for both sides.

Apart from giving India a technological edge, these private sector companies are also set to change the political landscape of India, both domestically and globally. Domestically, more companies will be able to cooperate and compete with global partners, and that will allow them to function efficiently. On the global front, this move put India in the same spot as major spacefaring nations. While it will bring more FDI to India, it also gives out a strong message of the increasing

market space that India is willing to offer to the world and its determination to progress in critical sectors. It will also have positive externalities in other sectors, including technology, skill development, Make in India, employment creation, start-up boost, and economic incentives. The move is in the right direction and will bring sweet fruits in good times.

NOTES:

[1] "India opens its space sector to 100% foreign investment with new FDI policy," *WION*, February 23, 2024, India opens its space sector to 100% foreign investment with new FDI policy - World Business Watch News (wionews.com). Accessed on February 28, 2024.

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[3] "India eases approval process for foreign direct investment in space sector," *Reuters,* February 22, 2024, India eases approval process for foreign direct investment in space sector | Reuters. Accessed on February 28, 2024.

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[6] Julia Seibert, "Top Private Space Companies in India & Industry Landscape," *Space Impulse,* July 12, 2023, Top Private Space Companies in India & Industry Landscape (spaceimpulse.com). Accessed on March 5, 2024.