

INVESTING IN JAPAN'S FLEDGLING SPACE INDUSTRY

FINANCIAL INSTITUTIONS HAVE A VITAL ROLE TO PLAY in propelling Japan's space industry forward.

The global space industry

broke all records in 2022 with 180 successful rocket launches — almost 25% higher than the number launched the year before. While the US and China accounted for the lion's share, Tokyo-based company Space One is paving the way for Japan's space industry to catch up, by aspiring to provide the country's first private launch services.

Mitsubishi UFJ Financial Group (MUFG) has been investing in and engaging in a strategic partnership with Space One since December 2022.

The space company aims to provide 20 launch opportunities in Japan annually in the near future — a far greater number than the country's space agency JAXA currently achieves each year.

A high number of launches is critical, because the high costs associated with low launch frequencies have been an obstacle for Japan's private sector to leverage small satellites. Shipping satellites overseas to be launched by commercial rockets poses similar operational and financial burdens.

"Progressing private rocket-launch services is the first step towards establishing a sustainable and profitable space industry in Japan," says Takumi Hashizume, managing director of the Sustainable Business Division (SBD) — which includes a space innovation team — at MUFG Bank, based in Tokyo. Space One marked the first of MUFG Bank's investments in the space industry. The aim is to

start a cascade of successes that will help Japan's space industry take off.

GLOBAL VALUE CHAIN

"The commercial space industry is evolving rapidly in other parts of the world. An important role for MUFG is to create an ecosystem in which Japanese businesses can become active players — particularly by expanding the space industry in Japan — and to link that with international supply chains," says Daisuke Nishiyama, head of the SBD.

Major banking groups in Japan, such as MUFG, go beyond providing financial

services. They also offer research and consulting, to companies under the groups' umbrellas. As such, they serve as an intermediary that links Japan to international organizations, scientists to businesses, and industry to society.

"Without incentives to go to space, rockets are meaningless," says Nagayama, a manager at Space One on assignment from MUFG. "MUFG's access to various industries has helped immensely in increasing the value of Space One services, and building a framework in which Space One services are used more often. This includes nurturing new suppliers."

Sporadic launches in Japan made it difficult for domestic parts suppliers to make profits, forcing some to withdraw from the production of rocket parts entirely.

"Some parts are reliant on imports. As launches become more frequent with Space One, suppliers have a better chance at lowering costs and becoming profitable," explains Nagayama. "MUFG facilitates negotiations with businesses to use more parts manufactured by Japanese suppliers, in order to establish a value chain within the country. They also identify businesses that have relevant knowledge, for example, businesses producing



▲ Space One's Space Port Kii, where rockets are launched from in Wakayama Prefecture at the southernmost point of Japan's main island of Honshu.

electronic parts for vehicles — and encourage them to venture into space technology."

With more frequent satellite launches in sight, MUFG subsequently invested in Astroscale, a leading Japanese company engaged in space-debris removal. "Debris removal is crucial for the space industry to become sustainable," explains Hashizume, as debris not only damages satellites, but leads to more debris as pieces break off from satellites that were hit. Furthermore, dodging debris uses up fuel, shortening the useful lifetimes of satellites.

In the long term, MUFG expects space-debris removal to prolong the lifespan of satellites, giving rise to new business opportunities such as the leasing or sales of used satellites in space.

"FOR THE JAPANESE SPACE INDUSTRY TO MATURE WE STILL NEED MANY MORE INDUSTRY PLAYERS"

FOCUS ON STRENGTHS

The expansion of the space industry creates new opportunities to utilize Japan's sensing technology, in which the country is a global leader. MUFG envisions sensing technology to produce new data that inform types of investments that are based on a company's environmental or social footprint, as well as initiatives related to sustainability.

"JAXA's satellite GOSAT was a pioneering technology for sensing carbon dioxide and methane on Earth from space. The data is still used to objectively visualize greenhouse gas emission and absorption, contributing to environmental monitoring," explains Hashizume.



▲ An artist's impression of the satellite PETREL, which will collect chemical and ecological data about the Earth.

"In a similar vein, the satellite Hyperspectral Imager Suite (HISUI) — with hyperspectral sensors developed by the Japanese Ministry of Economy, Trade and Industry — has also delivered data on the distributions of minerals, plastics and agricultural crops."

Furthermore, PETREL, a technology developed at the Tokyo Institute of Technology, performs multispectral and hyperspectral observations of land and sea, promising to yield useful data for agriculture, forestry and fisheries. For example, it can detect plankton blooms that suffocate fish, which aquaculture businesses can leverage to relocate fish stocks.

A project to apply HISUI's and PETREL's capabilities to smaller satellites was selected for the Key and Advanced Technology R&D through a Cross Community Collaboration Program by the Japanese Government's Cabinet Office, aimed at bolstering future economic security.

Using alternative data from satellites, MUFG Bank is collaborating with Mitsubishi UFJ Research & Consulting (MURC) and private companies

to develop monitoring solutions for issues related to health and the environment in southeast Asia. The bank is also looking into developing data solutions with Mitsubishi Electric (Melco) to detect change and deterioration in infrastructure such as buildings, bridges and roads in Japan more quickly and efficiently than humans can.

MORE SPACE STATIONS

As the age of commercial space stations dawns, the prospect of conducting research in microgravity space is becoming a reality for the private sector. By facilitating the inclusion of Japanese businesses in international space station initiatives, MUFG hopes for industries such as medicine and semiconductors to reap benefits.

Given Japan's inexperience with developing and operating an entire space station, a good policy would be to develop modules that dock onto space stations, Hashizume says. "After the International Space Station, Japanese firms will have to partner closely with major international players in space stations," he says.

Partnerships are being set up with the government of Oita prefecture — which plans to partially convert its airport into a spaceport — and Sierra Space, developing space planes that transport people and goods between destinations in space. The partnership is a starting point for transforming Oita into a space hub which attracts researchers and businesses in space technology.

"For the Japanese space industry to mature, we still need many more industry players to participate, including other financial institutions," says Hashizume. "Having a bird's eye view of the entire business ecosystem and its pain points is key for driving industry growth, and for the finance industry to benefit from long-term economic growth." ■



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