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Contribution of Moon Village to Solving Global Societal Issues (2)

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IS THE LUNAR ECONOMY SOLELY FOR THE SPACE INDUSTRY? OPPORTUNITIES FOR NON-SPACE COMPANIES IN LUNAR INFRASTRUCTURE LEVERAGING TECHNOLOGICAL SYNERGIES.

Abstract

Joint infrastructure ventures between space and non-space companies can create benefits for all stakeholders. This includes initiatives for cis-lunar exploration, where infrastructure is particularly resource intensive. This paper aims to support involvement of terrestrial sectors in cis-lunar infrastructure projects, by providing evidence-based management frameworks. The study between the SDA Bocconi Space Economy Evolution Lab and the Moon Village Association Lunar Commerce and Economics Working Group supports joint work on the Lunar Commerce Portfolio – a study on the lunar economy, whose first edition was published in November 2022. For space industry actors, the potential benefits of joint development with non-space actors are widespread. Space agencies could reduce resources dedicated to technology design and development, which could be redistributed for sustaining purchase agreement contracts. Space companies could reduce market uncertainties, increasing the economic attractiveness of projects, while reducing liabilities through risk allocation. Financially, equity providers could be incentivized by the participation of non-space corporates as risk takers, signaling venture reliability to capital markets. Non-space actors could also benefit considerably from advanced science-based technology innovation with reduced uncertainties. Target applications would be explicitly defined in arrangements with space industry partners, with non-space firms acting as a supplier or investor within the joint venture. This provides opportunities for high technology RD with identifiable end-uses and reduced risk. Further, the target market is represented by collateral terrestrial customers, for whom the technology could be adapted and traded. Terrestrial spillovers could also contribute towards the UN's 17 Sustainable Development Goals. Embarking on space-for-space activities entails pursuing the industrialization of technologies to serve a concentrated portfolio of customers. These activities are extremely risky, and would be priced by a ratio-

nal investment manager accordingly, unless a diversification strategy is pursued, or returns on investment are exceptional. Lunar infrastructure, and the collaboration of space and non-space players, is exemplary of this, and therefore offers multiple areas of investigation under management perspectives, such as correction of market failures, infrastructure financing, and technology commercialization. This paper therefore brings evidence on how non-space companies can contribute to the realization of lunar infrastructure through exploiting technological synergies. While the paper focuses on the lunar economy as an emerging area of interest, its findings carry broadly applicable lessons to other areas of space technology.