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Economic analysis of both actual and potential future benefits from space activities and applications to nations and peoples. (3)

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A DATA-DRIVEN PROPOSAL FOR JOINT COLLABORATION IN SPACE EXPLORATION

Abstract

The UN Office of Outer Space Affairs identifies synergy of space development activities and international cooperation through data and infrastructure sharing in their Sustainable Development Goal 17 (SDG17). Current multilateral collaboration paradigms in space, however, are divided between the Artemis and the Roscosmos-CNSA programs to return to the moon and establish permanent human settlements. As space agencies work to expand human presence in space, economic resource consolidation in pursuit of ambitious and technologically complex space expeditions will accomplish SDG17. This paper creates a budget dataset for the top fifteen federally-funded space agencies and uses it to analyze their economic contributions toward space development. Using time-series econometric analysis methods in STATA, this work identifies significant trends and forecasts of future space expenditures for each country. Econometric analysis methods test for breaks in the data to mitigate any potential skews from global economic crises. The findings reveal opportunities for international cooperation in the context of sustainably returning to the moon. The econometric analysis results inspire three return-to-the-moon cooperation scenarios presented as case studies: a cis-lunar space station, short duration lunar surface missions, and development of a moonbase. Optimal economic allocation of resources by the respective space programs in the context of these scenarios are proposed.