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ECONOMICAL FEASIBILITY OF REUSABLE LAUNCH VEHICLES FOR THE LIMITED-MARKET-SIZE ENTITIES

Abstract

With the rise of the new-space era, many countries not only try to analyze their domestic competitiveness of space-related industries but also present policies to cultivate the self-sustaining ecosystem. In particular, the research and development of a space launch vehicle, which serves as a catalyst for technological innovation in terms of breaking the huddle to access the space, faces the dramatic paradigm shift from the government-protected national project which implicitly imposing military and strategical purposes to the purely commercial tools of mobility that has been driven by the innovative companies armed with the disruptive technologies such as the reusability pursuing extreme cost competitiveness. But, this kind of United States driven commercial new-space strategy is quite effective and viable just for a few entities that have a certain level of demand for space transportation like the United States or China. Needless to mentioning the low cost per payload to the space, for the so-called game-changing technology of the reusable launch vehicle, some countries that do not have confidence in sufficient space transport demand, the development program of the reusable launch vehicle is just a declarative and it is still difficult to secure more than the meaning of technological research topic.

In this respect, this study intends to examine whether the possibility of destructive innovation such as reusable launch vehicles according to the size of each country's space launch vehicle industry ecosystem could have the resilience. In particular, considering the price elasticity of demand (PED), the necessity of disruptive space transport innovation results to the less service price was elicited as a technology driving force incurring other demands for the space transportation. In the end, the expandable value-proposition behind the reusable launch vehicle technology considering the PED for countries with limited space transport demand, such as Japan, Korea, and Brazil have been justified and their direction to this technological RD has been advocated.