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ECONOMIC EFFICIENCY OF A MINI UPPER STAGES: OPPORTUNITIES, APPROACHES, SOLUTIONS

Abstract

When spacecraft developers fulfill a state order, they work under state regulation not according to market laws, but according to the rules established by the state system of the country. Such rules introduce uncertainty into the process of designing and manufacturing products of high complexity with a long development period, since there are significant risks due to the high volatility of macroeconomic indicators and the national currency, inflation, changes in the refinancing rate, leading to increase in the cost of credit resources, which may affect the cost of components and the whole product. The formation of a segment of the private space services market in Russia has been actively discussed, which requires the formation of methodological and methodological approaches to the commercialization of space activities and evaluation of its effectiveness. The private space services must be considered not in isolation, but as a part of the process of creating a new internal space market for Russia with various basic segments, such as the segment of launch services. The main goal of the work is to form an integrated approach to assessing the cost and effectiveness of space services, depending on their complexity, duration, and demand. The definition of "economic efficiency" indicator requires consideration of a set of theoretical, problems that arise when solving specific applied scientific and technical problems in conditions of limited resources, uncertainty, and dynamics of adjacent markets. At the same time, it is necessary to move away from traditional views on this problem. The paper proposes an approach to assessing the effectiveness of private space services for launching spacecraft using mini upper stages. It is shown that in order to expand the market and increase investments in this area, through the stabilization of pricing, it is possible to achieve cost reduction using a fixed cost of space services. This will not only reduce the cost of a particular service, but also allow small companies to take advantage of such a service, which, in turn, can expand the pool of potential customers and develop commercialization directions. The presented simplified scheme for estimating the cost of services obtained during the operation of mini upper stages allows us to move away from traditional methods for estimating such services and the traditional indicator of the cost of the payload mass, to assessing the duration, effectiveness and efficiency of the services provided. This work should accelerate the commercialization of the space market.