

Simulation of costs for launching carrier rocket when inflation changes

© G.A. Badikov, A.A. Bolotskikh, S.A. Zdorovets

Bauman Moscow State Technical University, Moscow, 105005, Russia

To maintain the Russian Federation's leading position in the carrier rocket market, it is crucial to control the necessary costs. Existing economic models do not allow to take into account the changes occurring during the operation of the launch vehicle. The article proposed the addition of a model that takes into account the change in the number of launches per year and the cost of modifying the carrier rocket. This model is used for comparative modeling of costs for launching modern carrier rockets: Proton-M, Soyuz-FG, Arian-5, Falcon-9, Atlas V401, Delta Heavy. It is concluded that the most intense competition for commercial launches in the coming years will be between the Soyuz-FG, Proton-M and Falcon-9 carrier rockets, which have the advantage of lower costs. The change in inflation from 0 to 25 % with an error of no more than 1.6 % can be taken into account by the changing interest rate of the investment project, where development costs are considered as investments. Modeling the cost of launching modern carrier rockets (Proton-M, Falcon-9, Atlas V401) showed that when inflation changes from 4 to 25 %, it is necessary to use the model proposed in the article. If inflation is 0 ... 4 %, a simpler model gives similar results.

Keywords: carrier rocket, cost reduction, investment analysis methods, reusable stage, production quantity, learning curve, accounting for inflation in the economic model

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Badikov G.A., Cand. Sc. (Eng.), Assoc. Professor, Department of Industrial Management, Bauman Moscow State Technical University.
e-mail: grigori.badikov@rambler.ru

Bolotskikh A.A., student, Bauman Moscow State Technical University.
e-mail: 79161424838@yandex.ru

Zdorovets S.A., student, Bauman Moscow State Technical University.
e-mail: Ws4415@yandex.ru