

A SYSTEMS APPROACH TO ASSESSMENT OF RISKS OF UNACCEPTABLY LOW PROJECT PROFITABILITY

Vasilieva N., PhD, Associate Professor

(Department of Higher Mathematics Odessa State Academy of Civil Engineering and Architecture)

Vasiliev A., PhD, Associate Professor

(Department of Mathematical and Computer Modelling Odessa I. I. Mechnikov National University)

A new systems approach to quantitative estimation of financial risks of investment projects was proposed: an integral risk of the project as a whole for all its parameters at once and the risks for each of its parameters separately. At the same time, the very concept of the project risk has been generalized: instead of the conventional risk of unprofitability, a new, more general concept of the risk of unacceptably low project profitability has been introduced. Two levels of the project profitability were considered: a level acceptable to the investor and a realistically achievable level. Corresponding values of design parameters and indices of financial efficiency of the project were found for these levels. Based on the found values, relative margins of investment acceptability and risks of unacceptably low profitability of the project were calculated. A procedure of comprehensive assessment of the risk of unacceptable low profitability of the project for cases of high certainty and partial uncertainty has been developed. Explicit formulas for quantitative risk assessment of unacceptably low profitability of the project have been derived, ranges of values of all risks under consideration have been determined and appropriate recommendations have been given. Explicit formulas for calculating the values of project risks and dynamic points of project acceptability are convenient and useful for software implementation (for example, within the Monte Carlo method). For the Monte Carlo method and the method of scenarios, another alternative approach to assessing the integral risk of unacceptably low project profitability was proposed by the authors based on the direct calculation of unacceptable scenario values of any criterion of the project financial efficiency. A new index of financial efficiency of the project has also been introduced: a discounted period of acceptable return (discounted payback period of the project is its special case).