

Portfolio and Scenario Analysis in the Cost-Effectiveness Evaluation of Weapon Systems

Jussi Kangaspunta, Ahti Salo and Juuso Liesiö

Systems Analysis Laboratory

Helsinki University of Technology

P.O. Box 1100, 02015 TKK, Finland

jussi.kangaspunta@tkk.fi, juuso.liesio@tkk.fi, ahti.salo@tkk.fi

Abstract: Cost-effectiveness evaluation of weapon systems is challenging due to multiple mission objectives, interactions among weapon systems and the large variety of operating situations where these systems may be used. We develop a portfolio-optimization model to identify cost-effective combinations of weapon systems at different budget levels and in view of different objectives. The model – which builds on results from combat simulations – also accounts for incomplete information about the importance of mission objectives and the probabilities of operating situations.

Keywords: multiple-criteria decision making, decision support systems, resource allocation, portfolio analysis, scenario analysis.