

Make-or-Buy Decisions in the Aerospace Defense Industry Under Geopolitical Risk

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Abstract

In the contemporary defense industry, the procurement of complex aircraft components transcends mere cost-efficiency, evolving into a multidimensional strategic imperative critical to national sovereignty. This study proposes a robust Multi-Criteria Decision-Making (MCDM) framework designed to optimize "make-or-buy" configurations for aerospace components within the defense sector. The model integrates quantitative operational metrics—such as unit cost, production capacity, and workload volume—with qualitative strategic determinants, including technological competence, specialized labor force, and strategic criticality. Recognizing that standard operational conditions are increasingly disrupted by geopolitical tensions and systemic uncertainties, the proposed model evaluates decision stability across three distinct scenarios: a baseline "Business-as-Usual" scenario, an "Embargo/Sanctions" scenario, and a "Systemic Financial Crisis" scenario. By employing sensitivity and scenario analyses, this research elucidates the shifts in criteria weighting and the resultant volatility of optimal sourcing decisions. The findings provide decision-makers with a resilient and adaptive roadmap, ensuring procurement strategies remain robust against external shocks while safeguarding technological autonomy.

Keywords

Make or Buy Decision, MCDM, Defense Industry, Aircraft Components, Scenario Analysis.

Biographies

Ömer Oker is a graduate student in the Department of Industrial Engineering at Gazi University, where he is currently in the thesis stage of his Master's degree. He received his Bachelor's degree in Industrial Engineering from Gazi University in 2023. His research primarily focuses on multi-criteria decision-making (MCDM), strategic risk management, and their applications within the defense industry. In addition to his academic pursuits, he has a professional interest in budget management and cost estimation. He is currently employed at a leading defense industry company, where he is conducting his thesis research.

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