

DECISION SCIENCES INSTITUTE

ST-VIKOR: Accounting for Stochastic Data and Risk Attitudes in Multi-Criteria Decision Making

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ABSTRACT

We define a stochastic extension of the VIKOR multi-criteria framework (ST-VIKOR) that incorporates the risk attitudes of decision makers (DMs) when ranking a set of stochastic alternatives. Differences in the attitudes towards risk of DMs determine their subjective beliefs when evaluating each alternative (per decision criterion) and generating the corresponding rankings. We validate the applicability and efficacy of ST-VIKOR through a case study in the banking industry and compare the results obtained with those of a stochastic super-efficiency data envelopment analysis model. The potential applications of ST-VIKOR range from economic and knowledge based systems to different decision support methods.

KEYWORDS: Multi-criteria decision making, VIKOR method, Stochastic data, Subjective judgments, Risk attitudes, Stochastic super-efficiency DEA