Simulation embedded artificial intelligence search method for supplier trading portfolio decision - DTU Orbit (23/04/2019)

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An electric power supplier in the deregulated environment needs to allocate its generation capacities to participate in contract and spot markets. Different trading portfolios will provide suppliers with different future revenue streams of various distributions. The classical mean-variance (MV) method is inappropriate to deal with the trading portfolios whose return distribution is non-normal. In order to consider the non-normal characteristics in electricity trading, this study proposes a new model based on expected utility theory (EUT) and employs a hybrid genetic algorithm (GA) - Monte-Carlo simulation technique as solution approach. In the real market data-based numerical studies, the performances of the proposed method and the standard MV method are compared. It was found that the proposed method is able to obtain better portfolios than MV method when non-normal asset exists for trading. The simulation results also reveal the accumulation effect along trading period, which will improve the normality of the supplier trading portfolios. The authors believe the proposed method is a useful complement for the MV method and conditional value at risk (CVaR)-based methods in the supplier trading portfolio decision and evaluation.

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