

## Optimal Investment Planning Considering Financial Risk Under Uncertainty

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Generally, investment planning optimization problems are trade-offs between expected performance (i.e., expected cost) and risk (i.e., risk, variability), resulting multi-period stochastic optimization problems.

In this presentation, a methodology is proposed to include financial risk management in the framework of two-stage stochastic optimization problem for investment planning under uncertainty. A probabilistic definition of financial risk and decision analysis method that consider decision maker's risk preference under uncertainty are adapted to be used in this framework.

Using these definitions, new two-stage stochastic optimization problem models that consider the financial risk are proposed.

The illustrative examples have been applied to show the proposed models. With the results, the maximization of the expected net present value by itself is not an appropriate objective and that solutions with higher risk exposure are obtained.