

## **A Resource Allocation Problem Under Risk Conditions**

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### **Abstract**

We considered a situation in which some projects should be chosen in a limited budget. Without any defending project, the loss is dependent on the specific site and the type and intensity of undesirable event. Each project which needs a certain amount of investment to implement is suitable for a subset of sites and has specific impact on loss depending on the event. It is supposed that for a specific site and project, the value of loss is a decreasing function in amount of investment. First, the probabilistic and strategic risk is considered separately then in final model, both of them are considered simultaneously. As there are many common projects which can support two kinds of risks, the problem is selecting projects to minimize the total expected loss from two different kinds of risks. These three problems are formulated as integer linear programming. An example has been solved and sensitivity analysis has been done. The results show that facing strategic risk, the weakest site has the highest priority to reinforce in order to decrease total loss but in order to reduce the loss originated from probabilistic risks, it should be strengthened the sites found by solving a knapsack problem.

### **Keywords**

Portfolio Selection, Resource Allocation, Strategic risk, Probabilistic Risk, Mixed Integer Linear Programming.

## **Biographies**

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