

# An Investment Decision under $L^q$ -minimizer Leads to Power Law Distribution

Hiroyuki Kato  
Faculty of Management and Economics,  
Kaetsu University

## **Abstract**

This paper employs the extended theorem of Savage that allows decision makers' objective functions to be deduced from minimization of  $L^q$  ( $q > 2$ )-loss function and considers situation in which they choose among investment objectives that have various probabilities of success. The results of this paper are that even if success probability is quite low, decision makers select risky projects when  $q$  is large and that when decision makers possess the information on the degree of which one project consists of multiple investment objectives, the more information they have the riskier projects they choose. In application, we find that the probability distribution deduced from this type of decision exhibits the power law at the upper tail with the value of  $q$  corresponding to the Pareto (power law) exponent.