

# Economic Screening Procedures Using a Correlated Variable with Multi-Decision Alternatives

Sung Hoon Hong\* · Do Sun Bai\*\*

\* Department of Industrial Engineering, Chonbuk National University

\*\* Department of Industrial Engineering, Korea Advanced Institute of Science and Technology

## Abstract

In a screening inspection, all items are subject to acceptance inspection. If an item fails to meet the specifications, it is rejected and excluded from shipment. Often the major quality characteristic (it is referred to as the performance variable) is difficult or expensive to measure. In such situations, we can often inspect the items with a correlated variable which is inexpensive to measure.

In this study we consider economic screening procedures using a correlated variable to grade the quality of the products that can be sold to several markets or used as components of several products with different profit/cost structures. It is assumed that the performance variable and the screening variable are jointly normally distributed. Profit models are constructed which involve three profit/cost components; profit from a conforming item, cost from an accepted nonconforming item, and screening inspection cost. Methods of finding the optimal screening procedures are presented and a numerical example is given.