

## Selecting the Best Population under Multiple Criteria: An Empirical Bayes Approach

*Liang-Yuh Ouyang* \*

Tamkang University

R.O.C.

*Bor-Ren Chuang*

Tamkang University

R.O.C.

### Abstract

Consider  $k$  ( $k \geq 2$ ) populations whose mean  $\theta_i$  and variance  $\sigma_i^2$  are all unknown. For given control values  $\theta_0$ ,  $\sigma_0^2$  and  $\delta_0$ , we are interested in selecting some population whose mean is most closed to  $\theta_0$  in the qualified subset in which each mean is no further than  $\delta_0$  from  $\theta_0$  and whose variance is less than or equal to  $\sigma_0^2$ . In this paper we focus on the normal populations taking normal distribution as its conjugate prior. However, the analogous method can be applied for the cases other than normal. A Bayes approach is set up and an empirical Bayes procedure is proposed which has been shown to be asymptotically optimal.

*Keywords:* Best Population, Multiple Criteria, Asymptotic Optimality, Empirical Bayes Rule.