EMPIRICAL BAYES RULES FOR SELECTING GOOD BINOMIAL POPULATIONS*

Shanti S. Gupta

Purdue University

and

TaChen Liang

University of Michigan

This paper deals with the problem of selecting good binomial populations compared with a standard or a control through the empirical Bayes approach. Two cases have been studied: one with the prior distribution completely unknown and the other with the prior distribution symmetrical about p = 1/2, but otherwise unknown. In each case, empirical Bayes rules are derived and their rates of convergence are shown to be of order O(exp(-cn)) for some c > 0, where n is the number of accumulated post experiences at hand.

1. Introduction.

The empirical Bayes approach in statistical decision theory is

appropriate when one is confronted repeatedly and independently with the same

decision problem. In such instances, it is reasonable to formulate the

component problem in the sequence as a Bayes decision problem with respect to an

unknown prior distribution on the parameter space and then use the accumulated

observations to improve the decision rule at each stage. This approach is due

to Robbins (1956, 1964, 1983). Many such empirical Bayes rules have been shown