ABSTRACT

It is a common procedure in statistical inference to pool two or more estimates of a certain parameter for increasing precision, when it is suspected that they are the same. The objective of this dissertation is to address to pooling *k*-reliability functions of the Weibull distribution under censoring for multiple samples.

We have developed some improved estimation strategies based on preliminary test and Stein-type shrinkage principles using Maximum Likelihood method. Large sample test-statistics have also been proposed to test the common reliability hypotheses of the Weibull distribution. The expressions of important asymptotic distributional results, and asymptotic properties like asymptotic distributional bias, asymptotic distributional quadratic bias, and asymptotic distributional quadratic risk were developed. We have compared the performance of these estimators by computing their asymptotic distributional quadratic risk under the sequence of local alternatives and regularity conditions. Graphs were also given in the support of results.

Keywords: Uncertain prior information, Pooling problems, Common reliability, Pretest estimation, Stein-type shrinkage estimation, Asymptotic distributional bias, Asymptotic distributional quadratic risk.