Title : An Efficiency Comparison of Testing the Homogeneity of Variances in Two Populations Using Nonparametric Statistics

Author(s) : 1. Ms.Chutikan Chulee   **Student ID :** 650510499

Major : Statistics

Advisor(s) : 1. Assistant Professor Dr.Manachai Rodchuen
                 2. Dr.Wisunee Puggard

Type of presentation :

☐ Oral Presentation

☑ Poster

☐ Cooperative Education

ABSTRACT

The objective of this research is to compare the efficiency of the Fligner-Killeen test, Ansari-Bradley test, and Moses test for testing homogeneity of variances between two populations, considering their ability to control the probability of type I error and power of a test, when data are normal distribution, beta distribution, and Weibull distribution. Sample sizes were (10,10), (20,20), (30,30), (20,10), (30,15), and (40,20), with variance ratios of 1, 1.5, 2.25, and 3.375 at a significance level of 0.05. This research used 40,000 simulations for each scenario.

The simulation results indicated that, when the data were normal distribution, beta distribution, and Weibull distribution, Fligner-Killeen test, Ansari-Bradley test, and Moses test can control the estimation of the probability of type I error in all cases. Furthermore, when considering the estimation of the test power, it was found that most Fligner-Killeen test provided the highest power estimate when the data were normal distribution. However, when sample size were small, the Ansari–Bradley test provided the highest power estimate for both equal and unequal sample sizes,   when the data is Weibull distribution, Fligner–Killeen test provides the highest   power estimate in all cases, when the data is beta distribution, Ansari–Bradley test provided high power estimate for equal sample sizes, while for unequal sample sizes, Fligner–Killeen test generally provides the highest power estimate.