

C723924 : MAJOR STATISTICS

KEY WORD: TEST FOR EQUALITY OF VARIANCES / TYPE I ERROR / POWER OF THE TEST

/ BARTETTE TEST STATISTIC / LAY-JACK TEST STATISTIC / O' BRIEN TEST
STATISTIC / MONTE CARLO

SIRIYUPA RASRI : A COMPARISION ON TEST STATISTICS FOR TESTING THE
EQUALITY OF VARIANCES . THESIS ADVISOR : ASS. PROF. CAPT.

MANOP VARAPHAK. 230 pp. ISBN 974-637-277-7.

The purpose of this research is to investigate the probability of type I error and the power of test for testing equality of variances (3 , 5 groups) by using Bartlett test statistic , O'Brien test statistic , and Lay-Jack test statistic in the case of same distribution and different distribution . The sample sizes are equal in each groups . The different proportion of variances at 0.01 , 0.05 , and 0.10 levels of significance are used. For each statistic under each experimental situation , the Monte Carlo Experiment is repeated 5,000 times.

Result of the study are as follows :

1. Robustness of the test : By considering the probability of type I error for each population , sample size , proportion of variance and level of significance , it is found that the distribution and sample size affected the robustness of the test.

2. The power of test : For Normal Distribution (symmetric) , Weibul Distribution (right skew) and the combination of Normal Distribution and Weibul Distribution , Bartlett statistic has the highest power. For the T-Distribution (symmetric long-tailed) , O'Brien statistic has found to be the highest power for small sample sizes (5,10) , and the Lay-Jack statistic has the highest power for larger sample sizes (20,30,50). For the combination of Normal Distribution and T- Distribution , O'Brien is the only one statistic that can control the probability of type I error for small sample sizes (5,10). However , no test statistic can control type I error if the sample size is larger (20,30,50) because it has more outliers in this case.

3. Proportion of variance , the population distribution , and sample size affect the power of the test.

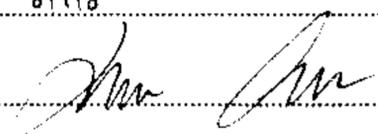
4. When the distribution is unknown , O'Brien test statistic should be used.

ภาควิชา.....สถิติ.....

สาขาวิชา.....สถิติ.....

ปีการศึกษา.....2540.....

ลายมือชื่อนิสิต.....ศิริยุภา ราชศรี.....

ลายมือชื่ออาจารย์ที่ปรึกษา..........

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