1117-62-443   **Huijun Yi*** (`hyi146574@troy.edu`) and **Bhaskar Bhattacharya**. *Contingency Table Analysis Under Linear Inequality Constraints.*

When analyzing I x J contingency tables, there are four established methods for estimating the cell probabilities with known margins (equal constraints), namely, raking (RAKE), maximum likelihood under random sampling (MLRS), minimum chi-squared (MCSQ), and least squares (LSQ). Under the situation where sampled and target populations are different, sets of general linear inequality restrictions can be considered as the prior information. It is of interest to present new models related to the above four methods of estimation subject to inequality constraints. Four methods are compared in a simulation study and data from a health and nutrition survey data. It shows that four methods rank differently under inequality than with equality.

Considering the difficulty of numerically solving primal problem due to large dimensions, we use the algorithm of Khun-Tucker conditions to exploit the duality for each method. It shows the dual problems could be substantially easier to solve than the primal problem for large I, J. (Received January 18, 2016)