



**An Optimization Approach
Applied to Optimal Allocation in Stratified Sampling**

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Abstract

The problem of optimal allocation of samples in surveys using a stratified sampling plan was first discussed by Neyman in 1934. Since then, many researchers have studied the problem of sample allocation in multivariate surveys and several methods have been proposed. Basically, those methods are divided into two classes: The first one involves forming a weighted average of the stratum relative variances and finding the optimal allocation for the average relative variance. The second class consists of allocation methods leading to coefficients of variation of estimators below specified thresholds for all survey variables of interest. This paper proposes a new optimization approach for the second problem. This approach is based on a non-deterministic optimization method. Several experiments showed the proposed approach provides efficient solutions to this problem.

Keywords: allocation; stratification; optimization.