

Preface

Usage is the best language teacher.

Quintilianus

The use of random sampling sustains the development of current statistical theory. In many cases it is necessary to have some control of the units to be selected. The solution in classic sampling is to use stratification, clustering, unequal probabilities of selection, etc. Ranked Set Sampling (RSS) is a new method of selection of samples. RSS allows controlling the selection procedure, as the sample will contain units in which the values of the variables of interest are spread throughout the interval of possible values. The sample consists of units with different ranks. Ranks are assigned using some auxiliary information; the judgment of experts is a particular case.

RSS is a kind of stratification. Hence, using this design instead of simple random sampling with replacement means that a gain in accuracy is straightforwardly achieved. It is sustained by the fact that each strata consists of population units with the same rank. The statistical properties of order statistics allow deriving the properties of RSS-based estimators. One of the main consequences of the study of RSS methods is determining formulas for evaluating the gains in accuracy as well as relative precision measures.

From the proposal of McIntyre (1952) to the book of Chen et al. (2004), the study of particular RSS strategies has produced a large number of papers and a body of models has formed an alternative theory of sampling. The number of theoretical papers and applications of RSS is growing. One of the usual problems in sampling applications is the presence of non-sampling errors. The effects of ranking errors have been studied. This work deals with the problems derived by no responses. RSS models after subsampling the non-respondents and imputation procedures are studied.

The aim of this book is quite modest; it attempts to be a systematic exposition of all that is contained in the literature on RSS in the area of missing observations. In writing this book, I tried to produce a text that is as simple as possible. My aim is to spread awareness of the potentialities of RSS. I am hopeful that this oeuvre will trigger additional theoretical research, as well as provide tools for practical

applications, when non-sampling errors are present and an RSS model is used. Hence my torch was Quintilianus maxima: consuetudo certissima est loquendi magistra.

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Carlos N. Bouza-Herrera

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Bouza-Herrera, C.N.

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