Chain regression-type estimator using multiple auxiliary information in successive sampling

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Abstract

In successive sampling, the use of auxiliary information for estimation of population mean on current occasion is a well explored area. In the present work, the information on an auxiliary variable, which is available on both the occasions, is used along with the information on the study variable from the previous occasion and the current occasion. Consequently, chain regression-type estimator for estimating the population mean are proposed in two occasions successive sampling. The optimal replacement policy is also discussed. We have also given an empirical study along with pictorial representation to examine the merit of the proposed estimator.

1. Introduction

When a population is subject to change over time, a survey on a single occasion does not provide information about the nature of change or the rate of change of the characteristics over different occasions and the average value of the characteristic for the most recent occasion or current occasion. To meet these objectives, sampling is done on successive occasions by retaining some units, drawn on the first occasion for its use on the second occasion and replacing the remaining by units drawn on fresh from the current occasion. The related theory and methods are called successive sampling which has drawn considerable attention of survey statisticians. This provides a strong mechanism to produce a reliable estimate of the population mean at the current occasion. In successive sampling over two occasions, the information on the study variable on the first occasion has been utilized as auxiliary information, which provides a strong mechanism to produce

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