For Favour of Posting

THE CHINESE UNIVERSITY OF HONG KONG

Department of Statistics

will present a seminar entitled

Endogenous Post-Stratification in Surveys

by

Professor Jay Breidt
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on

Monday, 19 November 2007
2:30pm – 3:30pm

in

Lady Shaw Building C5
The Chinese University of Hong Kong

Abstract:

Post-stratification is frequently used to improve the precision of survey estimators when categorical auxiliary information is available from sources outside the survey. In natural resource surveys, like forest inventories, such information is often obtained from remote sensing data, classified into categories and displayed as pixel-based maps. These maps may be constructed based on classification models fitted to the sample data. Post-stratification of the sample data based on categories derived from the sample data ("endogenous post-stratification") violates the standard post-stratification assumptions that observations are classified without error into post-strata, and post-stratum population counts are known. Properties of the endogenous post-stratification estimator are derived for the case of a sample-fitted generalized linear model, from which the post-strata are constructed by dividing the range of the model predictions into predetermined intervals. Design consistency of the endogenous post-stratification estimator is established under mild conditions. Under a superpopulation model, consistency and asymptotic normality of the endogenous post-stratification estimator are established, showing that it has the same asymptotic variance as the traditional post-stratified estimator with fixed strata. Simulation experiments demonstrate that the practical effect of first fitting a model to the survey data before post-stratifying is small, even for relatively small sample sizes. Some potential extensions are discussed.

This is joint work with Jean Opsomer, Colorado State University.

All are Welcome