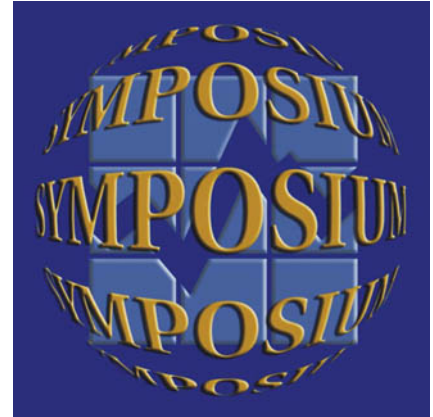**Statistics Canada International Symposium
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USE OF SPARSE-EFFECT MODELS TO CHARACTERIZE BIAS-EFFICIENCY TRADE-OFFS IN THE ANALYSIS OF COMPLEX SURVEY DATA

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ABSTRACT

In work with complex survey data, one often needs to use a single set of methods to produce a large number of estimates. Consequently, it may not be realistic to develop optimal estimators for each parameter of interest. Instead, one may seek to use point estimation and inference methods that will perform reasonably well both under idealized conditions and under moderate deviations from these conditions.

Practical implementation of this idea is often complicated the fact that there are many dimensions in which the abovementioned "moderate deviations" may arise. This paper suggests that sparse-effect models (developed in previous literature on fractional factorial experiments) may provide a useful framework through which to explore the effects of such deviations. For point estimators, special attention is directed toward the following evaluation criteria: (1) Biases under moderate deviations from idealized conditions; (2) Efficiency properties under moderate deviations from assumed conditions; and (3) Power to detect the deviations considered in (1) and (2). For interval estimators, we consider related issues focused on coverage rates and the distribution of interval widths. Some of the resulting diagnostics are applied to data from the U.S. Current Employment Survey and the U.S. Consumer Expenditure Survey.

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