

DISCUSSION

Gordon J. Brackstone, Statistics Canada
Tunney's Pasture, Ottawa, Ontario, Canada K1A 0T6

INTRODUCTION

This is an exceedingly important topic and I welcome the attention it is getting both through the Federal Committee on Statistical Methodology and through its inclusion in the ASA program. I appreciate also the invitation to participate in this session.

First, I must say that the Working Paper is an excellent review of survey design issues in establishment surveys, and of current practices among government agencies. It should achieve its intended purpose of providing "reference and guidance for survey practitioners across the Federal Government". I particularly liked the systematic approach of discussing the definition and sources of each type of error, than the different control and measurement methods, followed by a summary of the survey results relating to that error source - though I will have some comments later on how the error sources have been partitioned. It was difficult for Tom Plewes to do justice to the full Working Paper in the time available to him; it is equally difficult for a discussant with only 15 minutes. I will therefore restrict my comments to three aspects of this topic. Firstly, I want to say a few words about the scope of the paper as it relates to its stated motivation, namely the apparent decline in user confidence in economic statistics. Secondly, I want to comment on the partitioning of survey error that is used in the paper. Thirdly, I will mention some developments in Canada's economic statistics program that I believe reflect similar concerns to those addressed in this paper.

SCOPE AND FOCUS

"Focusing on Quality in Establishment Surveys" is the title of the session. Are we focusing on the right thing? I would suggest that we are focusing on only a part, albeit a critical part, of the broader problem of confidence in economic statistics which seems to have been the motivation for this exercise. If one stops to consider what it is about published economic statistics that might undermine user confidence in them, one might come up with four factors: wild or incredible fluctuations from period to period; changes in direction that are contrary to popular belief or experience; large or repeated revisions to the estimates in subsequent publications; and apparent inconsistencies between figures. It is generally such relativities that attract attention rather than disbelief in absolute levels of published numbers. It is not published measures of data quality that are attracting attention; it is characteristics of the data themselves. By focusing on "Quality in Establishment Surveys", this paper and the Working Paper emphasize the need to examine the quality of data that emerge from establishment surveys and feed the published economic

statistics. This should go a long way towards improving the understanding of data quality, of levels of random error, of possible biases that could cause inconsistency between series, and towards identifying ways of improving the quality of survey data. However, it leaves unaddressed many questions related to the revision and integration of data series. In many ways, the practices adopted for producing and publishing preliminary estimates and their subsequent revisions, including seasonal adjustment practices, can have more impact on public confidence in the data than the choice of sound survey methodology. This is not to argue that we should not be paying considerably more attention to methodology and the measurement of data quality in establishment surveys, but only to point out that this is just one dimension of the issue of public confidence in economic statistics. Some other dimensions - such as timeliness and relevance - though equally important, are explicitly outside the scope of the paper.

CLASSIFICATION OF SURVEY ERROR

I will now turn to some comments on the taxonomy of error types in the paper. To my mind the distinction between the different categories of error is not entirely clear. Let me give some examples.

Specification error is not part of the traditional error model. As defined here, it seems to embrace two distinct processes: the identification and justification of data needs, and the design of a questionnaire to satisfy these needs. These are both important, but distinct. The first is above the level of a particular survey since it must precede the decision to undertake a survey. Indeed, data needs may be met by means other than surveys. However, the translation of data needs into a questionnaire, which may include clarifying those needs, is very much a part of the survey. But then there is ambiguity between specification error and response error. Part of the definition of response error is "failure of an instrument to measure the value correctly". That seems awfully like "specification error can result simply from poorly worded questionnaires". Not surprisingly, methods described in the Working Paper for measuring specification error and for measuring response error are very similar.

The definition of processing error is too broad - it seems to include all human mistakes at any stage of the survey process. As such, it overlaps with most other sources of error, eg. non-response because an interviewer failed to ask a question, or response error because the interviewer led the respondent. How then do we distinguish processing error from these other sources of error? I would favour an approach that restricts the definition of processing error to errors in certain processing operations that aim to transform

the data (eg., coding, data capture). Processing errors occur if data are incorrectly transformed. Other forms of human error are contributions to other sources of error.

The treatment of edit and imputation in error analysis always presents difficulties. Edit and imputation aims to compensate for errors, not to introduce them. There are two aspects of edit and imputation that one can examine: (i) how much does edit and imputation change the data - this is reasonably simple to assess, and (ii) to what extent has edit and imputation improved the data - this is more difficult - particularly since imputation does not pretend to make each individual record accurate, but rather to improve the accuracy of statistical aggregates and to provide a more easily manipulable microdata base. I would have liked to have seen more attention given in the paper to the impact of edit and imputation on data quality.

DEVELOPMENTS AT STATISTICS CANADA

Let me turn now to relevant developments at Statistics Canada. First, let me assure you that having a centralized statistical system is not a sufficient condition for achieving a high-quality, integrated program of economic statistics - but it certainly helps. Despite having a central Business Register in Statistics Canada for many years, it is only recently that a redesigned register is becoming the integrating mechanism that it has always had the potential to be. Our Business Survey Redesign Project involves a complete redesign of the business register to create an effective common frame for all business surveys. We believe that frame maintenance should not have to be the concern of individual surveys, that information about changes in businesses obtained from one source should benefit all surveys, and that all surveys should use a common frame based on common definitions, structures and industry codes.

The second aspect of this development is the redesign of business surveys to utilize the new frame. This project constitutes a major effort to build quality into the economic statistics program. We are taking the opportunity to redesign and, as far as possible, standardize the methodology of business surveys following general strategies for annual surveys and for sub-annual surveys. While the main objectives of this exercise are to improve data quality, reduce costs, and ensure data consistency, an important impact will also be to reduce the unexplained variance in

methodology and data quality between different business surveys. In a way we would like to reach a situation where the variations in methodology and practices revealed by the excellent survey of establishment surveys described by Tom Plewes occur by design rather than by default.

A second relevant development at Statistics Canada was the reinforcement in 1985 of the Policy on informing users of methodology and data quality. The policy describes a goal of making available with all published data, information on the methodology used to collect the data as well as indicators of their quality. It provides an impetus to survey managers and designers to pay renewed attention to quality issues. Conformity to the policy is monitored periodically by one of Statistics Canada's management committees.

The third development, which is in part a supplement to the second, was the issuing of a set of Quality Guidelines. This document provides advice on "methods, procedures and practices that govern the pursuit of Quality objectives in the execution of statistical activities". Essentially this is a checklist - guidelines not standards - of issues to be considered in design and implementation of surveys.

I mention these developments at Statistics Canada because I think they reflect three primary objectives of "Focusing on Quality in Establishment Surveys:

- (a) consistency of concepts, definitions and frames across surveys;
- (b) making information on methodology and data quality available to users;
- (c) ensuring sound and consistent methodology across surveys.

CONCLUSION

There are many other comments one could make, but time does not permit. Early in his paper Plewes states that "very little in the way of theoretical or evaluative work on survey error has been published for establishment surveys". I might quarrel with that statement - depending on the interpretation of "very little" - however the author, and the authors of the Working Paper, have taken a major step towards ensuring that this statement will not remain true for long. This is an important first step towards improving "Quality in Establishment Surveys" which, in turn, is an important first step towards improving quality and confidence in published economic statistics. I hope that statisticians in government agencies and elsewhere will take up the challenge that this paper represents.