Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

10-Jun-2003

English - Or. English

STATISTICS DIRECTORATE

STD/STESEG(2003)12
For Official Use

OECD Short-Term Economic Statistics Expert Group

STESEG TASK FORCE ON TIMELINESS AND BENCHMARKING

DEVELOPMENT OF A FRAMEWORK TO ASSIST IN IMPROVING TIMELINESS FOR SHORT-TERM ECONOMIC STATISTICS

Paris, 26-27 June 2003

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1. This document is submitted to the Expert Group under item 5 of the Draft Agenda

2. The Expert Group is invited to:

COMMENT on the proposal in the body of the document

RESPOND to the recommendations for future work and resources required as outlined in paragraph 22.

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JT00145799

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DEVELOPMENT OF A FRAMEWORK TO ASSIST IN IMPROVING TIMELINESS FOR SHORT-TERM ECONOMIC STATISTICS

a. Introduction

1 Improving the timeliness of short-term economic statistics (STES) is a topic which has attracted enormous interest within the international statistical community in recent times. For example, it has been a key focus for the European Union (EU) with work being undertaken on a wide range of initiatives to achieve the timeliness targets set out in the EMU action plan[1]. It is also an important element of the International Monetary Fund's (IMF) SDDS[2].

2 To support these initiatives, there has been: numerous meetings and conferences organised to facilitate information sharing; attempts to identify and distribute best practices; the formation of methodological expert groups to provide recommendations; etc. In fact this is not a recent phenomenon, discussions on the timeliness of STES in international foray date back to a 1972 meeting of the United Nations Statistical Commission, and the twenty third Plenary Session of the Conference of European Statisticians in 1975 (Ryten, 1996).

3 Despite the importance of the topic, and the large amount of work undertaken in the international arena, a comprehensive framework to assist Statisticians in making informed choices on the best methods to employ within different stages of the statistical production process to improve timeliness has never been developed. This paper explores the issue of timeliness and its relationship to accuracy, and proposes a framework which could assist national statistical organisations (NSOs)[3] in implementing methods to improve the timeliness of the STES they produce. The aim of the framework is to cover all elements of the statistical production process, with an emphasis on presenting alternative methods for improving timeliness to ensure its relevance to a wide range of national statistical organisations, which we know operate under a variety of different circumstances.

b. Timeliness as a quality indicator and its relationship to accuracy

4 Timeliness is an important indicator of quality for STES, and is recognised as such in statistical quality frameworks such as those developed by the OECD (2003) and Statistics Canada (2002). Other relevant quality indicators (OECD, 2003) are accuracy, relevance, accessibility, coherence, interpretability and credibility. It has often been suggested (Ryten, 1996; Gnoss, 1996) that significant improvements in timeliness cannot be achieved without a loss in accuracy. Oberg (2002), argues this need not be the case,

[1] The European Monetary Union (EMU) action plan outlines a strategy for improvement of the timeliness and quality of European short-term economic statistics.

[2] The IMFs Special Data Dissemination Standard (SDDS) specifies requirements for the coverage, periodicity and timeliness of principal economic indicators, and for the dissemination of an advance release calendar.

[3] It is recognised that there may be more than one producer of official STES within a country and therefore the term NSO is intended to apply to all such organisations in the context of this paper.

citing examples where some countries appear to be both more timely and more accurate due to efficiency of operational procedures. This assertion is supported by Ahnert (2001) and Walkner (2001) who found that countries with more timely first releases of STES did not necessarily have larger revisions.

5 It is obvious that to improve timeliness in STES without a significant loss in accuracy some change to operational procedures or methodological techniques is required. Indeed timeliness can be considered a characteristic of the whole statistical production process (SPC Expert Group, 2002) for STES. Therefore, it would be useful to have some kind of framework (Ryten, 1996) to assist Statisticians in making choices on methods to use within each stage of the statistical production process, which enables the timeliest estimates to be produced with minimal losses in accuracy.

6 The issue of user requirements is particularly relevant here, as estimates produced to an earlier time frame and released only at aggregate levels could serve different user needs in comparison to more detailed statistics produced at a later time frame (Oberg, 2002). Of course minimising revisions between different releases for the same period remains an important issue.

c. A targeted approach, providing choices of methods to improve timeliness

7 A common theme of recommendations by various working groups to improve the timeliness of STES has been to identify and agree on best practices, and benchmark current procedures against agreed best practice (e.g. SPC Expert Group, 2002). However, this ideal may be very difficult to achieve for a number of reasons, including:

- what is best practice and who decides it? Would best practice for one country be best practice for another?

- would best practice apply to specific indicators, a group of indicators, or all STES (e.g. best practice procedures for the production of the consumer price index could differ substantially to best practice procedures for the production of retail trade statistics);

- user requirements may differ between countries;

- differences in legislation between countries may mean that application of certain processes are not possible or unlikely to be successful (e.g. voluntary or compulsory surveys, requirements to use administrative data to reduce response burden etc.);

- differences in economic structures between countries may mean that application of certain processes are not possible (e.g. the impact of predominantly monthly payrolls in Europe compared to predominantly weekly payrolls in the U.S);

- many countries may not have the resources or authority (i.e. depending on their institutional arrangements) to completely reorganise their production processes.

8 Therefore, the identification of best practice for the entire statistical production process for STES may not be a feasible concept due to the different exogenous influences facing the producers of STES in different countries. However, it is possible that certain elements of a range of good practices could be applicable to a much wider group of countries.

9 The distribution of good practices could possibly be facilitated by developing a framework which covers all aspects of the statistical production process for STES, and identifies different methods within each process which could assist with improving timeliness, together with associated techniques to avoid or minimise losses in accuracy. This would provide NSOs with a range of options for improving timeliness within different areas of the statistical production process, and they could assess which options best suit their particular circumstances. For example, an NSO may have to consider such issues as: their capacity to fund change; the legislative circumstances within which they operate; which options are likely to have the maximum benefit on timeliness at lowest cost or impact on accuracy; which options best fit with their existing processes and external circumstances; which options best meet the priorities of their users; etc..

10 Such a framework would need to access a huge amount of reference material. The emphasis would be on referencing methods with proven operational success or very sound theoretical basis for improving timeliness whilst minimising any expected loss in accuracy. The methods could either be generally applicable to the production of a range of STES (e.g. sampling techniques, data validation techniques) or specific STES (e.g. choice of reference dates for the CPI).

d. A framework of information and choices

11 For a framework to meet the goals outlined above it would have to be a multi dimensional web based product, with each successive dimension providing more detail on specific methods for improving timeliness within various statistical production processes**.** The web based document would be made accessible through the OECD internet site (www.oecd.org) which could be linked to other international statistical organisations and NSOs websites.

12 Each dimension of the framework would serve a purpose. The first dimension would provide a brief outline of methods that could improve timeliness within broad categories of the statistical production process. This may assist in stimulating ideas and recognising opportunities within an NSO. The following dimensions would provide more detailed summary information within each broad category, perhaps a synopsis on methods available with an expert opinion on their effectiveness under different circumstances. The final dimension would source to papers describing how certain methods were implemented within a country (preferably with an evaluation of their success), or papers presenting the results of thorough research on particular techniques with identified processes for implementation.

13 Because different aspects of the statistical production process are interrelated, the web document would need to provide links where the application of a particular method is related to, or dependent on, the application of some other method.

14 The table below attempts to illustrate how the initial dimensions of such a framework might be structured, and includes a (very preliminary) draft of the type of issues that would be covered. Note, in the table the term *advanced* estimates refers to early estimates for STES based on an estimation procedure substantially different to that for final estimates (e.g. from a sub sample, a regression model, etc.), whereas the term *preliminary* estimate refers to early estimates for STES which use essentially the same estimation procedure as for final estimates. Whilst some work has already been done to identify good practices related to the methods listed in column 3 of the table, it is not the purpose of this paper to present or discuss these methods. Therefore the table below does not give reference to sourcing detailed papers on particular methods, which would of course be a key part of the framework if it were developed.

Table 1 Possible structure of a framework to identify good practices for improving the timeliness of STES

Broad statistical function	**Statistical functions most relevant to timeliness (could be topic headings in the web document)**	**Methods to assist in improving timeliness and minimise loss in accuracy (each issue would link to more detailed summary information, and related information for other processes, in the web document)**
Frame selection	Choice of frame source	Suitable administrative sources with useful auxiliary information
		Using frames which only cover a subset of the population, but have more auxiliary information
	Requirements to use administrative data	Timely sources of administrative (or by product) data, and their relationship to STES
		Methods to augment survey data with administrative data to improve timeliness
		Methods to improve timeliness of estimates based only on administrative data
Questionnaire design	Questionnaire and form design	Minimisation of form size, the use of simple data item definitions (rather than complex statistical definitions)
		Designing a form suitable for efficient data processing (e.g. OCR, scanning, E-form, etc.)
		Integrating short and long forms, where only a small number of data items are collected from some businesses
	Choice of data items	Minimising data items to be collected, focusing on relevant and consistent data provision for a subject
		Collecting a subset of data items for compiling advanced estimates only
Sample design and selection	Sophisticated sample designs	Sample design methods maximising use of auxiliary information to minimise sample size
		Efficient sample designs for two phase estimation
	Sample designs for sub samples	Efficient sample designs for sub samples to support advanced estimates
	Sample selection methods to minimise sample size	Methods to maximise common sample between periods where new samples are drawn each period
		Use of infrequent sampling to maximise common sample between periods (ensuring representative samples)
Reference period & due dates	Choice of reference periods for STES	Options for using shorter reference periods for different STES (e.g. representative day or week of month)
	Due date for businesses providing data	Use of earlier due dates for sub samples collecting small number of data items to support advanced estimates
		Making use of data items relevant to STES that are more likely to be available earlier for some businesses
		Legislating for the provision of data by businesses by a certain date
Data collection and validation	Efficient types of data collection methods	Internet based methods, e.g. E-forms, use of email, direct extraction from company records etc.
		Telephone based methods, e.g. CATI, touchtone data provision, data provision by fax etc.
		Other technology assisted, e.g. use of form scanning, Optical Character Recognition (OCR) etc.
	Respondent relationships	Guidelines for effective cooperation with respondents, methods to measure and reduce response burden
	Follow up of non respondents	Use of mathematical frameworks to identify the most important non respondents to follow up
		Targeting subsets of important non respondents for telephone follow up
		Using automatic mail (email or post) reminders for non respondents

Table 1 (cont.) Possible structure of a framework to identify good practices for improving the timeliness of STES

Broad Statistical function	Statistical functions most relevant to timeliness (could be topic headings in the web document)	Methods to assist in improving timeliness and minimise loss in accuracy (each issue would link to more detailed summary information, and related information for other processes, in the web document)
Data collection and validation (cont..)	Efficient data validation methods	Automatic correction of suspect data
		Automated querying of suspect data with data receipt (e.g. with CATI, touchtone data provision, E-forms etc)
		Selective editing, only querying suspect data if an error would have a significant impact on estimates
		Efficient approaches to designing data validation rules
Organisational arrangements	Organisational arrangements focusing on timeliness	Optimal staff structures to fit with processing workflows
		Using the same staff on multiple STES by concentrating peak workloads (including staff training needs)
		Use of interactive technologies to streamline different aspects of the statistical production process
		Functional specialisation of staff for different aspects of the statistical production process
		Outsourcing functions of the statistical production process
Estimation	Data imputation methods	Sophisticated methods to impute for non respondents to enable accurate estimates at lower response rates
	Advanced estimates from sub samples	Sophisticated estimation methods for sub samples to minimise revision in later estimates
	Estimation based on lower response rates	Estimation methods to correct for the impact of lower response rates in preliminary estimates
		Suitability of estimates based on lower response rates for release at aggregated levels
		Optimal estimates of percentage change focusing on the common sample between two periods
	Model based estimates (nowcasting)	Advanced estimates based on relationships with other available data (e.g. from regression models etc.)
		Estimation based on a combination of admin data, expected values, models & survey data.
Dissemination	Streamlining dissemination processes	Electronic dissemination platforms connected to estimation systems
		Release of electronic products prior to paper publications
Evaluation	Assessment of user requirements	Timeliness and accuracy requirements for different users and levels of estimates (e.g. aggregate vs detail)
	Revision analysis	Identification of systematic biases and adjusting estimation methods to minimise bias in early estimates
		Simulation studies to assess the expected size of revisions as a function of release date (i.e. timeliness)
	Quality assessment	Monitoring the impact on quality measures after a change in the production process to improve timeliness
	Benchmarking	Achieving consistency in time series through benchmarking to more reliable annual data
		Identifying and adjusting for bias in sub annual estimates through benchmarking

15 Ultimately NSOs determine a strategy for the production of STES that encompasses all aspects of the statistical production process. Therefore, whilst the proposed framework seeks to separate these different processes and identify methods which can be used to improve timeliness within each, they should not be viewed in isolation (hence the need for links between related methods as outlined in paragraph 13). However, presentation of the framework in this way (i.e. by separate statistical production processes) would allow an NSO to evaluate where improvements in their processes could be made, to develop an optimal strategy for improving timeliness.

e. Practical issues associated with developing and maintaining a framework

16 Developing a framework of the kind suggested above would be a substantial task. Prior to beginning such a task, a number of practical issues would need to be resolved. Some obvious issues are identified below, together with possible approaches for addressing them.

(i) Should the framework be generally applicable to all STES, or focused on a specific subset of *principal*[4] short term economic statistics?

17 Clearly some aspects of the procedures and methods in the framework would be applicable to a wide range of STES. However it would make sense for the framework to concentrate on methods associated with improving the timeliness of the most important STES to keep it manageable.

(ii) It is essential that the framework contains all the best techniques, but how would candidate good practices be initially identified?

18 One suggestion is to review the procedures for countries that produce the timeliest STES at present. However this strategy may not always elicit methods expected to have wide applicability to all countries. Therefore it would also be important to focus on countries where recent improvements in timeliness have been made, as this would invariably have involved some form of analysis from the country concerned. In addition, countries should be encouraged to provide information on certain aspects of their statistical production processes they feel are particularly effective at improving timeliness, accuracy, or minimising costs. An important issue here would be language. At a minimum, an abstract or summary of the relevant documents explaining the processes would need to be provided in English. Finally, it is also important that related work of other groups and organisations (e.g. research institutes, academia) are identified and considered for inclusion in the framework, possibly through establishing networks with the respective organisations.

(iii) What should be the criteria for referencing a particular method in the framework? Who would decide if the method is *good practice*?

19 It is important that the framework identifies and promotes the most relevant methods, rather than all methods; otherwise it would be little more than an expensive search engine. Therefore some form of expert group would have to be established to evaluate candidate good practices, and to write a summary expert opinion on various methods available within statistical functions. This represents the major resource commitment required by international and national statistical organisations, either through provision of appropriate human resources (i.e. the experts) or to fund other representatives (e.g. academia, although the focus of the framework would be on practical measures rather than theoretical).

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[4] For example, the Principal European Economic Indicators (PEEI) developed by the Statistical Program Committee (SPC), or the principal indicators identified in the IMFs SDDS. Both of these lists only cover a subset of STES.

(iv) How would the framework be maintained over time, to ensure it contains reference to the most recent developments in good practice?

20 A process of review for the framework would be required, probably every two or three years. This would also require a commitment of resources, but no where near as large as for the initial development. This process of review could possibly be managed through STESEG with the OECD taking the lead role.

21 Responsibility for coordinating the development of the framework would most probably lie with the OECD, reporting to the STESEG. However, as indicated above, significant commitment and contribution (i.e. human resources) would be required from other international and national statistical organisations, and possibly central banks and academia. In fact, all OECD countries would have to be involved at least indirectly in an effort to identify candidate good practices.

f. Conclusions and recommendations for future work

22 The literature on STES suggests there is demand for a framework which can aid Statisticians in the implementation of methods to improve the timeliness of STES, whilst minimising any impact on accuracy. This paper proposes such a framework and outlines the content it should contain. The framework would have wide applicability to countries within and outside the OECD, as a comprehensive reference to NSOs seeking to improve the timeliness of their STES, and as a tool to use within bilateral programs at country level (i.e. where one country provides aid to another on developing their statistical capacity). However the development of such a framework would require the commitment of substantial resources and an assessment needs to be made of the associated costs and benefits. Therefore the STESEG is asked to consider the following important issues relevant to any future work on this topic:

- is the type of framework proposed in this paper sensible?

- if such a framework were developed, does the STESEG feel it would it be used extensively by NSOs which would therefore justify the cost of its development?

- would members (i.e. organisations represented) of the STESEG be prepared to commit the resources required to develop the framework?

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