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OECD Short-Term Economic Statistics Expert Group

**Short-term Economic Statistics Expert Group (STESEG):
Task Force on Timeliness and Benchmarking**

Promoting the use of benchmarking techniques for short-term economic statistics

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*Prepared by Richard McKenzie
Statistics Directorate
OECD*

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Contact: Richard McKenzie (richard.mckenzie@oecd.org)

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PROMOTING THE USE OF BENCHMARKING TECHNIQUES FOR SHORT-TERM ECONOMIC STATISTICS

Executive Summary

1. This paper briefly summarises the work of STESEG and the OECD on the topic of benchmarking over the past 2-3 years, and outlines the benefits of using benchmarking techniques for short-term economic statistics (other than national accounts). The paper also describes the benchmarking software ECOTRIM – a user friendly Windows based benchmarking software developed by Eurostat. This freely available software can provide statistical organisations with a resource to perform benchmarking in a consistent manner across countries.

2. STESEG members are asked to provide written comments on the following two issues within the papers they are required to submit on their reactions to preliminary STESEG outputs:

(1) does STESEG see the use of benchmarking methods for short-term economic statistics (other than national accounts) as a high priority for implementation within OECD Member countries?

(2) what strategies could STESEG use to promote the use of the ECOTRIM software to perform benchmarking for STES, at the very least in an experimental manner?

Background

3. Benchmarking is defined as the process of correcting inconsistencies between two sources of data for the same target variable which are produced with different frequencies (e.g. monthly and annual retail trade statistics). The issue of using benchmarking techniques for short-term economic statistics (STES) has been discussed at the previous two STESEG meetings in 2002 and 2003. The paper on benchmarking for the 2002 STESEG meeting (Maitland-Smith, 2002) outlined the importance of benchmarking for short-term economic statistics and provided a detailed description of effective methods which can be used and issues which need to be carefully considered when performing benchmarking. The 2003 STESEG paper (Fassler, 2003) looked at the circumstances where benchmarking is appropriate for short-term economic statistics and discussed the advantages and quality improvements possible from performing benchmarking for STES. In November 2003 the OECD and Eurostat held a joint workshop on benchmarking methods and recent methodological developments in this field. This included a demonstration of the Eurostat software ECOTRIM, a freely available user friendly Windows based software package for performing benchmarking.

Introduction

4. The purpose of this paper is to briefly summarise the work of STESEG and the OECD on the topic of benchmarking over the past 2-3 years, and to seek comment from STESEG on what more can be done to promote the use of benchmarking techniques for short-term economic statistics. An important aim of the paper is to encourage the distribution and use of the ECOTRIM software, which can provide statistical organisations with a resource to perform benchmarking in a consistent manner across countries.

Benchmarking methods

5. The use of benchmarking techniques to align more frequent data (e.g. monthly / quarterly) with less frequent (e.g. annual) but generally more accurate data for the same economic variable has been a topic of great importance amongst national accountants for many years, principally for aligning quarterly and annual national accounts. This is due to the fact that sources for annual national accounts in most countries tend to be far more comprehensive and accurate than quarterly sources, and benchmarking improves the quality of the quarterly national accounts. Also, users would be become confused and lose faith in the statistical office if estimates of the national accounts at different frequencies showed inconsistencies.

6. It is also widely recognised that the process of benchmarking quarterly to annual national accounts provides opportunities for improving the reliability of the quarterly data, through the identification of systematic biases. These biases can be minimised by improving the methods used to collect and compile data for the quarterly accounts, and through sophisticated statistical and econometric models available in benchmarking software.

7. It is not the purpose of this paper to present the methodology of benchmarking. A comprehensive source for information on this topic is the proceedings of the OECD / Eurostat conference: *Applicaton of Advanced Temporal Disaggregation Techniques to Economic Statistics*, held in Paris on 27 November 2003. These proceedings can be found at: www.oecd.org/std/research/benchmarking.

8. This workshop discussed traditional and contemporary methodologies for benchmarking and temporal disaggregation for all economic statistics (i.e. the workshop was not restricted to national accounts). Temporal disaggregation is defined as the process of deriving high frequency data from low frequency data, generally based on an indicator available at the high frequency. When a high frequency indicator is used, benchmarking and temporal disaggregation are the same processes in practical terms.

Benchmarking for economic variables other than national accounts

9. Many countries produce estimates for specific economic variables (e.g. Retail Trade, Industrial Production, Manufacturing Sales, Employment etc.) at high (e.g. monthly) and low (e.g. annual) frequencies¹. However the use of benchmarking techniques to reconcile these estimates at different frequencies for economic variables other than national accounts components is not standard practice across all national statistical organisations (NSOs).

10. The United States is one country where benchmarking is used for most economic variables. Previous papers presented at the 2003 STESEG meeting have shown the positive impact this can have on the quality of U.S. short-term statistics for Retail Trade (McKenzie, 2003) and Unemployment (Brown, 2003). The advantages of using benchmarking in the U.S. was also strongly emphasised in the task force report on the EU-US benchmark study to the Statistical Programme Committee in September 2001. This report highlighted the central role that benchmarking plays in the United States to help reduce sample sizes (and resultant costs), improve timeliness and facilitate convergence between sub-annual and annual data². Action 4 of the task force recommendations advocated the use of similar techniques in the European Statistical System. The OECD also recommends that benchmarking of short-term indicators to annual

¹ In fact, economic variables produced at monthly and /or quarterly frequency are often used as inputs to quarterly national accounts whereas the often independent and more reliable annual data for these variables are used in the compilation of annual national accounts.

² Report of the Task Force on Benchmarking in Infra-Annual Economic Statistics to the SPC, September 2001, page 10.

figures should be implemented wherever theoretically appropriate (Maitland-Smith, 2000), and should be linked to the development of consistent revision policies.

Appropriate conditions for using benchmarking techniques for STES

11. Where NSOs compile estimates of the same economic variable at different frequencies there can be a range of different issues that need to be taken into consideration before deciding whether it is appropriate to align the higher frequency statistics with the lower frequency through benchmarking.

Relationship between the variables being measured at high and low frequency

12. A common feature of short-term economic statistics (i.e. monthly / quarterly) is that their scope and coverage is often less complete than for less frequent data (e.g. annual) for the same economic variable. For example there may be differences in the: coverage of establishments; sample size; quarterly and annual accounting methods used by respondents; degree of commodities included; industries or geographical areas represented etc. Thus, short-term indicators will generally be less accurate and may suffer from bias in comparison to more comprehensive annual data. As a result, monthly or quarterly STES are often viewed as serving only to determine short-term movements, with annual data determining overall levels and medium-to long-term trends.

13. As an example of the situation where the low frequency data have superior scope and coverage than the high frequency data, one may consider a monthly survey of trade turnover which excludes some trade activities and establishments below a certain size in comparison to turnover data from a more exhaustive annual survey. Discrepancies on trade turnover levels or growth rates from these two sources might be accepted due to the differences in scope and coverage, although discrepant movements are likely to be scrutinised to determine whether it is for the total or at detailed levels of sub-activities, in particular the likely impact of those activities excluded from the scope of the short-term indicator.

14. Benchmarking in this case needs to be considered carefully. Even though the scope of the high and low frequency surveys may be different, it may still be judged worthwhile benchmarking the total, or benchmarking may be confined to those sectors common to both surveys. If the differences between the two surveys are substantial then it may be judged best not to benchmark. However, even in this last case the use of benchmarking could still be beneficial, as the analysis of discrepancies between the annual and short-term estimates could lead to improvements in the estimation processes for both the annual and the short-term statistics.

15. A different situation would be when the scope and coverage for the target variable is exactly the same (or very similar) in the monthly (or quarterly) and annual survey, but the latter provides more precise results (for example, due to a larger sample). If discrepancies between these sources were significant, the process for compiling the monthly estimates should be reviewed. Benchmarking provides a discipline to perform this analysis, and will also eliminate discrepancies in the longer time series for the short-term indicator. This can be very important for the purposes of empirical analysis performed by analytical uses, in particular for government policy making departments (e.g. government treasuries and central banks), who desire accurate long time series of high frequency data.

16. A third case to be considered is when the short-term data have a related and more reliable annual measure which is compiled using a different methodology. Let us consider, for example, a monthly index of industrial output mostly based on volume and quantity indicators, and value data on output from an annual survey. Volume indices of industrial output obtained by deflation of the data from the annual survey could be used as benchmarks for the monthly index of industrial output.

Consistency of annual estimates

17. It is important that an annual series is consistent if it is to be used as a source for benchmarking a related short-term series. However, the focus of NSOs may often be on producing the highest quality data on annual levels, independent of previous estimates. To achieve this goal, NSOs may often introduce changes to annual survey processes between years such as the incorporation of administrative data, sample redesigns, questionnaire redesigns, changes to data collection methodology etc. Such changes can have a large impact on the comparability of annual level estimates for a particular variable between years, such that the estimate of percentage change from the previous years estimate may not be reliable. Under these circumstances, the annual series would not be appropriate to use as a benchmark source for the related short-term series.

18. Therefore, where NSOs plan to benchmark their STES to annual sources, it is important that the consistency of the annual series is maintained over time. Consequently, the quantitative impact of any changes to the process of compiling the annual statistics must be taken into account by revising the historical annual series, before using this series to benchmark the related short-term series.

Summary of the advantages of using benchmarking for STES

19. In general, the process of benchmarking short-term economic statistics to more reliable annual series can have the following advantages:

- ensures consistency between the high and low frequency data for the same economic variable which avoids confusion for users;
- provides a mechanism to review the consistency of estimates between the high and low frequency data sources, which may identify biases or other problems and lead to improved estimation and compilation practices for both sources;
- improved accuracy for short-term economic statistics achieved through benchmarking may enable lower sample sizes to be used which may reduce costs and / or provide opportunities for improving timeliness;
- establishes an accurate long time series of high frequency data which can lead to improved empirical analysis being performed by analytical uses, in particular for government policy making departments (e.g. government treasuries and central banks);
- improved quality of input series to quarterly and annual national accounts and;
- helps to minimise discrepancies shown between source data and the national accounts for distinguishable components.

Achieving international consistency in the application of benchmarking techniques for STES

20. There are many different methods available for performing benchmarking, which makes it confusing for NSOs to choose the most appropriate methods to use and can affect the international comparability of output. Ideally the same principles or set of techniques would be used by all NSOs, such that these techniques adhere to a set of principles, for example (Moaro and Savio, 2001):

- the techniques should be flexible enough to allow for a variety of time series to be treated easily, rapidly and without too much intervention by the user;

- they should be accepted by the international specialized community;
- the techniques should give reliable and meaningful results;
- the statistical procedures involved should be run in an accessible and well known, user friendly, and well sounded software program.

The ECOTRIM benchmarking software

21. The Windows based benchmarking software ECOTRIM, developed by Eurostat, satisfies these qualities. The main attributes³ of the ECOTRIM software are:

- it has a user-friendly interface which can be run in an interactive or batch mode;
- it supports a range of internationally recognised benchmarking methodologies, such as those developed by Denton and Chow & Lin;
- it can perform both univariate and multivariate (e.g. where a number of accounting constraints may need to be satisfied⁴) temporal disaggregation and benchmarking;
- it provides a range of options for the user to specify their own models based on ex-post analysis statistics provided within the software (e.g. correlation between estimates and related series);
- it provides a range of statistics to assess the quality of program output;
- Eurostat plans to improve the functionality of the ECOTRIM software in the near future, to include more sophisticated methods of temporal disaggregation⁵, pre-treatment of series, additional quality reports and an improved graphical interface.

22. This software is currently freely available through written request to Eurostat, and it will soon be provided free on the Eurostat website. There are several users of ECOTRIM both within and outside Europe, not only for national accounts but also for statistics on industrial production, employment, monetary aggregates and unit labour costs⁶. The availability of ECOTRIM was advertised when the proceedings of the November 2003 OECD / Eurostat workshop were provided on the OECD website. Since then, several requests for the software have been received from a variety of national and international organisations. Attachment 1 contains a list of organisations that have requested the ECOTRIM software and the purpose they intend to use it for.

³ More comprehensive information on the attributes of the ECOTRIM software are provided with the proceedings of the OECD / Eurostat benchmarking workshop as referenced in paragraph 7.

⁴ ECOTRIM can be used to force the additivity of seasonally adjusted series for aggregate and sub-components where these separate components have been seasonally adjusted directly.

⁵ In particular, the inclusion of dynamic models to facilitate improved forecasting of indicator and benchmark variable relationships, based largely on the work of Professor Tommaso Di Fonzo

⁶ The OECD has used ECOTRIM in a research project to compile quarterly unit labour costs data for Member countries, using annual unit labour costs data derived from national accounts as a benchmark and experimenting with different quarterly indicator variables.

Promotion of benchmarking techniques and the ECOTRIM software by STESEG

23. Broad application of the ECOTRIM software throughout the OECD would represent a big step forward in standardising methodologies used in the compilation of short-term economic statistics amongst Member countries. It would also provide the means for NSOs to experiment with benchmarking for STES, rather than having to develop their own software. The STESEG would appear to be the logical group to promote the use of this software within OECD Member countries for short-term economic statistics (i.e. outside the field of national accounts). Therefore, members of the STESEG are requested to provide comment on the following issues:

- (1) does STESEG see the use of benchmarking methods for short-term economic statistics (other than national accounts) as a high priority for implementation within OECD Member countries?
- (2) what strategies could STESEG use to promote the use of the ECOTRIM software to perform benchmarking for STES, at the very least in an experimental manner?

24. One suggestion for the second issue is for a number of STESEG representatives to nominate to trial the ECOTRIM software, for benchmarking one or several of the STES under their control. The results of this trial and any plans for implementation within their production systems could then be presented at the 2005 STESEG meeting.

REFERENCES

- Brown, S. *Benchmarking State Labour Force Estimates in the United States*, OECD Short-Term Economics Statistics Group Expert meeting, June 2003.
- Di Fonzo, T. *Temporal disaggregation of economic time series: towards a dynamic extension*. Luxembourg: Office for the Official Publications of the European Communities, 2003.
- Fassler, F. *Benchmarking of Short-Term Economic Statistics*. OECD Short-Term Economics Statistics Group Expert meeting, June 2003.
- Gennari, P; McKenzie, R & Ullberg, A. *Case Study : Timeliness of Retail Trade Statistics in Italy, Sweden and the United States*. OECD Short-Term Economics Statistics Group Expert meeting, June 2003
- Maitland-Smith, F. *Consistency Across Economic Statistics in the U.K.*, workshop on quarterly national accounts, OECD Paris June 2000.
- Maitland-Smith, F. *Use of Benchmark Data to Align or Derive Quarterly/Monthly Estimates*, OECD Short-Term Economics Statistics Group Expert meeting, June 2002
- Moauo G. and G. Savio (2001), *Disaggregation of time series using common components models* (mimeo).
- Nanopoulos, P & Oberg, S., *Benchmarking in infra-annual economic statistics*; final report of the Task Force to the SPC, 42nd meeting of the SPC, 2001.

Attachment 1 Requests for ECOTRIM following OECD / Eurostat benchmarking workshop

| Organisation | Intended use |
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| Statistics Canada | Wide range of short-term indicators |
| University of Europe | General research on economic statistics |
| OECD | Research project to develop measure of quarterly unit labour costs |
| Bank of Korea | Monthly business surveys |
| European Central Bank | GDP projections |
| Institute for Economic Research, Germany | GDP |
| Statistics Latvia | Consumer surveys |
| Polish Ministry of Finance | Not specified |
| Statistics Spain | GDP |
| United Nations Statistics Division | To distribute to developing countries for use in GDP |
| Reserve Bank of El Salvador | GDP |
| Statistics Mexico | GDP |