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OECD Short-Term Economic Statistics Expert Group

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BENCHMARKING OF SHORT-TERM ECONOMIC STATISTICS

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The author of this contribution to the discussion group on this site bears the sole responsibility for both the substance and the style of the contents. The purpose of the discussion group is to elicit comments and to promote debate on specific topics. As such, the views expressed on any of the issues raised are not to be attributed to the IMF.

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BENCHMARKING OF SHORT-TERM ECONOMIC STATISTICS

I. INTRODUCTION

The purpose of this paper is to promote discussion on whether benchmarking techniques should be applied to short-term economic statistics to align them with lower frequency and more reliable data for the same variable being measured. The paper raises some issues that may be useful to consider in taking a decision on whether benchmarking is appropriate for a specific indicator.

II. WHEN AND WHAT TO BENCHMARK

a. Benchmarking in general

Benchmarking is a process by which high- frequency data series are made consistent with low-frequency data series. As stated in the Quarterly National Accounts Manual of the IMF¹, Chapter VI, “The problem arises when two series show inconsistent movements and the less frequent data are considered the more reliable of the two”.

Benchmarking of quarterly national accounts is probably the most common situation in which these techniques are applied. In that case, benchmarking consists in adjusting the quarterly national accounts data to the annual data (the benchmark) so the sum of the four quarters of each year is equal to the corresponding annual figure. Annual estimates, usually based on more comprehensive and detailed source data are considered more reliable than quarterly estimates which are usually based on more limited data sources. It should be noted that annual national accounts estimates may also need to be benchmarked when less frequent and more reliable data become available, e.g. economic censuses undertaken every five years.

Discrepancies between monthly and annual data in short-term statistics may be present in many indicators, like industrial production indices, services turnover surveys, employment data, etc. However, no discrepancies occur when the annual data is obtained as the sum of the monthly data, or what is the same, when the annual index is obtained as the average of the monthly indices. The latter situation is likely to be common with price indices but also is applicable to other statistics like industrial production indices. Other short-term indicators may be subject to discrepancies when the data sources for its monthly compilation differ from the annual sources. This situation is common when sub-samples of annual surveys are used to collect information for the short-term data while the full size sample is used to collect the annual information.

There are numerous benchmarking techniques, although an appropriate technique must aim to produce a benchmarked (adjusted) series that reproduce as close as possible the short-term movements of the original series. That means that the adjustment of the quarterly data should be done in a smooth way,

¹ Quarterly National Accounts Manual: Concepts, Data Sources, and Compilation; Adriaan M. Bloem, Robert J. Dippelsman, and Nils O. Maehle; International Monetary Fund, Washington D.C., 2001

by minimizing the differences on the movements shown between the original and the benchmarked series. In general, a technique often used but not recommended is to prorate the difference between the independent annual data and the one derived from high frequency data proportionally to the distribution of the latest among the sub-periods of the year. This technique should be avoided because of the step problem it introduces between data of successive years.

b. Benchmarking short-term economic data

The need to benchmark quarterly national accounts to annual results is more evident than the need to benchmark short-term economic indicators. National accounts, irrespectively of their periodicity, should be comprehensive in the sense that all economic activity should be covered, so different annual growth rates or annual levels derived from quarterly accounts and from direct annual measures would lead to confusion of the users. Contrary to the national accounts, short term indicators may have a different scope and coverage than relevant annual data, and appropriate awareness of the differences by users might be enough to let them feel comfortable and accustomed with such situation.

As an example of the above mentioned issue, one may consider a monthly survey on trade turnover which excludes some trade activities and establishments below a certain size and compare its findings with 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 scrutinized whether it is for the total or at detailed levels of sub-activities. Benchmarking in this case may not be needed, nor justified, since it may be thought that measurements of different scope and coverage should not be forced to be identical. Although in this case the need for benchmarking may be arguable, the analysis of the discrepancies between the annual and the short-term statistics could lead to improvements of the estimation processes for both the annual and the short-term statistics.

A different situation would be when the target variable is exactly the same in the monthly as well as in the quarterly (or annual) survey, but the latter provides more precise results (for example, due to a larger sample). If the discrepancies were significant, obviously the monthly sample should be reviewed and probably increased, but if not, these discrepancies may be eliminated using benchmarking. This situation might be present in the compilation of most of short-term indicators (industrial production indices, employment, turnover, etc.).

A third case to be considered is when the short-term data have a related and more reliable annual measurement or the same variable is annually estimated using a different methodology. Let us consider, for example, a monthly index of industrial output, mostly based on volume and quantity indicators, and data on output from an annual survey. Volume indices of industrial output obtained by deflation of the data from the annual survey might be used as benchmarks for the monthly index of industrial output. However, considerations have to be made regarding the appropriateness of the deflators, in general, and to the possible bias introduced by deflating annual instead of monthly figures.

Annually updating indices' weights is another form of benchmarking. Laspeyres type monthly indices may be calculated every year using the weights of structure surveys related to previous year data. These indices are chain-linked with previous year indices calculated on a fixed reference period (apparently, this is a procedure used by the Netherlands in the compilation of the industrial production index; an annual linking procedure is used). Chain-linked indices of short-term indicators have the advantage of reflecting more accurately the changes of the aggregates than the fixed base indices and to be consistent with the recommended method of calculating volume measures in the 1993 SNA. Chain-linking using the annual link can, however, introduce a step problem therefore preference should be given to the link in the last

month of the previous year. The latter means the recalculation of the index of the last month of previous year using the weights of that year.

c. Countries practices

Benchmarking short-term economic statistics does not seem to be a very spread practice among the OECD countries participating in this task force: a) The industrial production index is known to be benchmarked only by 2 countries (Netherlands and USA) out of the nine participating countries; b) the retail trade turnover is known to be benchmarked only by the USA; c) employment data appears to be the most subjected to benchmarking with 5 of the participating countries applying it. No benchmarking is known to be applied to “turnover for other services industries”.

III. Conclusions

In most cases where there is an annual (or quarterly) and more reliable data source to estimate a short-term economic indicator, it is possible to benchmark the short-term series to the annual data. This however should be done using appropriate techniques that avoid the step problem in the benchmarked series. From the four different cases presented for discussion, it seems that benchmarking may only not need to be applied when the scope and coverage of the annual data is different than the scope and coverage of the high frequency data. The main reason for that would be that it is assumed that benchmarking should not be looked as a technique to fill the gaps of information of the short-term statistics. Naturally, distinguishable components of the annual data representing the same variable as in the high frequency data may be used for benchmarking the corresponding components in the short-term data series.

Benchmarking seems appropriate in cases when the short-term data series are obtained from surveys based on sub-samples of the surveys used to collect the more reliable low frequency data. Furthermore, updating the weights of indices series is also considered as benchmarking and special procedures are required to avoid breaks in the series. Finally, benchmarks consisting of measurements of the same or similar concept as measured in the high frequency series, but obtained using different methods should also be considered valid.

Benchmarking the short-term economic data have many advantages: i) consistency between the high and low frequency data that avoid confusion; ii) short-term data that incorporate the information of more reliable benchmark data; iii) possible quality improvements of the short-term data with the involvement of its compilers in the benchmarking process, which usually is left for the users, mainly the compilers of the national accounts; iv) more readily source data available for the compilation of the national accounts; and, v) less discrepancies shown between source data and the national accounts for distinguishable components.