

A basis for classifying reasons for revisions to short term statistics

OECD/ Eurostat taskforce

Performing Revisions Analysis for Sub-Annual Economic Statistics

A. Introduction

Timely economic statistics are needed by users so that their decisions better reflect current economic circumstances. Typically, the first publication of any data release will provide a timely source of evidence to meet this need, and will be based on relevant information available at the time. However, this information is often incomplete, so that revisions to official estimates are an expected and inevitable consequence of an explicit trade-off between their timeliness and their reliability. Understanding the underlying revisions process is therefore of much interest to NSIs and to users of official statistics.

To help both producers and users of official statistics better understand the revisions process, it is helpful to have a framework for classifying revisions to their causes. Producers of short term statistics want to know why revisions have occurred in the past, in part to enable these to be explained to users, but also so that they can understand better those causes of greatest significance. Most users also want to know why revisions have occurred, for example to allow them to anticipate the extent to which similar revisions might occur in future. For this purpose, at the very least, it is helpful to distinguish revision which occur as a 'regular' part of the compilation cycle, and those which might be best considered as 'one-off'.

Many different bases for classifying revisions to short term statistics have been proposed, and no doubt most producers will have their own basis. Annex 1 gives some recent examples.

B. What do we want from a classification scheme for revisions?

It is clear from annex 1 that many of the proposed classification schemes identify similar broad themes:

- all recognise the difference between routine revisions and less regular or 'one-off' revisions;
- most distinguish 'errors' from other causes;
- most separate out methodological improvements.
- some also present types of revisions in an hierarchical structure, grouping together like types.

Based on the existing classifications schemes, it appears that desirable characteristics include:

1. It should be applicable to all short term statistics.
2. It must be practical to implement for producers. i.e. the reasons for revision should be recognisable by NSIs as affecting their own compilation systems.
3. It should be sufficiently detailed to:
 - allow identification of underlying causes of revision;
 - support an assessment of the extent to which historical revisions might be used as the basis of forecasting future revisions.
4. Producers should be able to decide at which level the scheme is appropriate to their needs and available resources. More detail is likely to require more sophisticated and costly processes to compile regular statistics.
5. Ideally, it should allow that the total revision is equal to the sum of revisions to each sub-category. However, in practice, particularly for revisions arising from seasonal adjustment, where multiplicative models tend to dominate, it is recognised that this kind of additivity may be very difficult to achieve.

C. A proposed classification scheme

Based on discussion within the current taskforce and on feedback from the OECD STSWP in June 2007, and Eurostat's Euroindicators meeting in December 2007, a classifications scheme has been developed. This is attached as annex 2.

The proposal meets most of the desirable characteristics identified above, at least to some degree. It should be applicable to all short term statistics, and is sufficiently general to allow practical implementation, at least down to the level of the second digit of the classification.

The scheme also attempts, at its highest level, to recognise that revisions to short term statistics take place according to a reasonably well understood 'revisions cycle'. This distinguishes between 'routine' revisions to early estimates, to 'exceptional' revisions arising from methodological changes and revisions to the NACE, SNA etc.

The structure of the scheme and its contents have also been kept sufficiently broad to reduce the potential for misinterpreting each of the categories.

D. Calculation issues

i) General considerations

The amount of detail which NSIs choose to adopt from the nomenclature depends in part on how they decompose of revisions. For example, in order to calculate the amount of the total revision coming from a particular methodological change it may be necessary to 'run' results several times, each time introducing a new element of the revision. Taking a specific example, in order to isolate the impact of revisions from the introduction of chainlinking, the following approach could be used:

- a) run results on the previous, fixed base, basis;
- b) run results with chainlinking introduced;
- c) measure the impact of chainlinking by differencing b)-a).

This approach may not capture fully the interactions between the various sources of the total revision (say between late data and methods changes), but it provides a practical basis for assigning revisions in a purely 'additive' way.

Ultimately though, the details of estimating the allocation of the aggregate revisions to detailed causes is best left to NSIs, given that compilation practices are likely to be relevant to a decision on the best approach to use, and that these vary widely. More generally, NSIs should consider the extent to which their compilation systems 'fit' the proposed structure and the level of the detail in the scheme most appropriate to them.

ii) treatment of time series adjustment

In the case of time series adjusted series, revisions can arise from a number of causes, including:

- the addition of the latest data point;
- revisions to previous data points;
- changes to the basic model;
- changes to prior adjustment;

- occasional changes in the aggregation structure or level at which time series adjustment is applied (where the indirect approach is used);
- etc.

The interaction between these causes is difficult to decompose. In addition there may be interest in how much of the total revision to a seasonally adjusted series might be attributed to the various components of the series, i.e. the trend, cycle, irregular and seasonal parts. However, because of the practical difficulties in separating out these effects, the proposed classification scheme does not attempt to distinguish between them. Instead it simply identifies revisions to the underlying data (items 1.1 in the nomenclature) separately from those arising *directly from the process* of time series adjustment itself (item 1.2). This separation though introduces a practical difficulty: how much of the total revision should be assigned to 'revisions from changes to data' and how much to the time series adjustment of those data?

One practical approach is to make three separate seasonal adjustment runs at time t , as follows¹:

- (1) seasonally adjust the series for periods up to and including $t-1$ *before taking on any data revisions* (i.e. the output of the time series adjustment from the previous period);
- (2) add the latest data point for time t to the *unrevised* series for periods up to and including $t-1$, and seasonally adjust;
- (3) update the series for periods up to and including $t-1$, taking on later data etc, and re-run the seasonal adjustment.

Revisions to seasonally adjusted series can then be attributed as follows:

- 'revision from changes to data' (items 1.1 in the nomenclature) is given by (3) *less* (2);
- 'revision from time series adjustment' (item 1.2) is given by (2) *less* (1).

These can further be broken down into the various sub-causes (e.g. 1.1.1, 1.1.2 etc) using the approach described under 'general considerations', above.

¹ [Note that this approach only requires one *additional* run of the seasonal adjustment (i.e. step (2) above): the other runs are simply the 'final' run from the previous period (i.e. (1)) and the 'final' run from the current period (i.e. (3)).]

E. Conclusion

There have been numerous schemes developed for the classifying revisions to short term statistics. Typically, these have been established for particular purposes, and indeed many countries have their own basis for classification. These schemes are of themselves useful, but do not support a basis for international comparisons or consistency over time. This paper draws on the many classification schemes which have been proposed and attempts to rationalize and refine these, retaining the basic features common to most schemes. To be of use, the proposed scheme in annex 2 would need to be embraced by producers and international organisations.

Annex 1: Overview of some previously proposed nomenclatures

1. ECB (STESWP paper June 2006)

1. New information
2. Conceptual changes (improved sources, better deflators etc.)
3. Seasonal and working day adjustment
4. Different geographical or institutional layers ((.e.g. revision to EU aggregates caused by compilation from country estimates)
5. Correction of errors

2. IMF (Working paper "Revisions policy for official statistics: A Matter of Governance" August 2003):

1. Incorporation of more complete or otherwise better source data:
 - Incorporation of source data with more complete or otherwise better reporting.
 - Incorporation of source data that more closely match the concepts.
 - Replacement of first estimates derived from judgmental or statistical techniques when data become available or as a result of benchmarking.
2. Routine recalculation:
 - Incorporation of updated seasonal factors.
 - Updating of the base period.
3. Improvements in methodology:
 - Changes in statistical methods.
 - Changes in concepts, definitions, and classifications.
4. Error correction:
 - Correction of errors in source data and computations.

3. ISTAT (Working paper for the current OECD Revisions TF)

1. Current revisions
2. Periodic revisions
3. Occasional of extraordinary revisions
4. Revisions from update of time series adjustment
[in addition, ISTAT suggest that a *triangle* can be derived by adding the additional dimension of time of revision.]

Annex 1 (cont): Overview of some previously proposed nomenclatures

4. STATS Canada (J Taillon)

1. Methodological changes (conceptual changes, change in classifications, definitions)
2. Benchmarking (the quantity of data increases)
 - annual surveys, tax data...
 - re-basing, annual chain-linking (routine recalculations)
 - population census
3. Evolution of data (the quantity of data increases)
 - data replacing forecasts
 - higher response rates
 - revised source data
 - SA (routine recalculations)
4. Compilation/ balancing of methods improved
5. Alignment of accounts with conceptual targets:
 - capitalisation of software;
 - SNA93, ESA95

5. OECD (outcome of workshop Oct 2004 – as proposed by UK)

- A. As indicator data evolve (= increasing quantity of data)
 - data replacing forecasts
 - increased response rates
 - revised source data
 - seasonal adjustment
- B. As benchmark data available (= increasing quantity of data)
 - Annual surveys, tax data, government expenditure, etc.
 - re-basing - 5-yearly, annual chain-linking
 - population census
- C. As data sources improved (= one-off improvements)
 - new survey or admin data sources appear/developed
 - improved survey forms
- D. As compilation/balancing methods improved (= one-off)
 - moving to use of supply-use tables on quarterly basis
- E. As accounts brought in line with conceptual targets (= one-off)
 - SNA93, ESA95
 - allocation of FISIM
 - capitalisation of software

Annex 1 (cont): Overview of some previously proposed nomenclatures

6. UK (as used in current UK estimates of GDP(P))

- 1 Forecast data for proxy series replaced by actual data
- 2 Forecast data for deflator series replaced by actual data
- 3 Firmer actual data for proxy series received from supplier
- 4 Firmer actual data for deflator series received from supplier
- 5 Seasonal adjustment (from later data)
- 6 Changes to 2-digit data quality adjustments (automatically assessed)
- 7 Changes to 2-digit quarterly coherence adjustments (automatically assessed)
- 8 Changes to MIDSS adjustments
- 9 Other
- 10 Changes to weights (automatically assessed)
- 11 Seasonal adjustment review
- 12 Methodological changes, ie. Industry review
- 13 Changes to annual coherence adjustments (automatically assessed)
- 14 Errors - Source error
- 15 Errors - Processing error

Annex 2: A nomenclature for classifying reasons for revisions to short term statistics

1. Routine revisions

1.1 Data revisions

- 1.1.1 Incorporation of 'late' data (e.g. from increased response rates to surveys)
- 1.1.2 Replacement by data of judgment or of values derived largely by statistical techniques
- 1.1.3 Incorporation of data more closely related to the concept being measured (e.g. alignment with estimates based on annual structural surveys)
- 1.1.4 Correction of data/compilation errors

1.2 Time series adjustment revisions

- 1.2.1 From concurrent adjustment
- 1.2.2 From reassessment of adjustment
- 1.2.3 From changes to the time series model

2. Exceptional revisions

2.1 Changes in concepts, definitions, and classifications.

- 2.1.1 Changes in classifications
- 2.1.2 Rebasing
- 2.1.3 Rereferencing
- 2.1.4 Other changes in concepts, definitions, and classifications

2.2 Methodological improvements

- 2.2.1 Improvements to estimation methods
- 2.2.2 Revisions arising from changes in surveys
- 2.2.3 Introduction of new data sources
- 2.2.4 Other methodological improvements