



OECD SHORT-TERM ECONOMIC STATISTICS WORKING PARTY
(STESWP)

Country comments:
Development of guidelines on seasonal adjustment practices

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STESWP 2007 – Country comments on OECD paper: Development of guidelines on seasonal adjustment practices

STESWP delegates from agencies in each non-European Union OECD Member country and non-member observers are asked to consult with the relevant experts in their agency / organisation on the draft Euroindicators Working Group seasonal adjustment Guidelines and provide written comment on:

- (i) the possibility of their implementation by their statistical agency; and
- (ii) identify and outline specific problems / issues with any of the individual draft guidelines.

STESWP delegates from agencies in all countries (i.e. OECD Member countries and non-member observers) are also asked to identify:

- suggested avenues of possible future STESWP work on the seasonal adjustment topic to further harmonise the seasonal adjustment methods applied at the national level.

Czech Republic

General remark regarding seasonal adjustment:

The guidelines could be specified for different statistics and kind of series (series of indices like IPI, series of data in natural or monetary units), because some problems may have different relevancy and solution (weights for SA EU aggregates of indices like IPI).

Remarks to separate points:

2.2 Consistency between raw and SA data, including adjustment methods

The irrelevance of consistency among (yearly) totals of original, SA, WD or even trend cycle series shall be discussed with subject matter experts within international institution, working group etc. However if the requirement on consistency is strong, some practically oriented methodological guidelines shall be provided to national statistical institutes.

2.5 Data presentation issues (trend-cycle estimates, seasonally adjusted estimates etc.)

Users require case studies on interpretation of growth rates of different series, differences among different series (original, SA, WD adjusted). There is still a lot of controversy how to use adjusted data among users.

3.1 Timing of revision and re-estimation of ARIMA models and coefficients

The choice of model revision policy depends on revision policy of original series. If the series changes every period (like quarterly GDP), it makes sense to re-estimate parameters of models every period at least. The different revision policies of standard production process may be taken into account in the future.

3.2 Concurrent versus extrapolated seasonal factors

The remark is relevant both to point 3.1 and 3.2. Even if both the model and the parameters are fixed in the SW Demetra, due to using asymmetric filters both „ends“ of adjusted series are changing. But only data for new observation (or only part of the original series revised) of adjusted series are sent to international organizations. This may lead to the differences between adjusted series disseminated by national statistical institutes and international organizations. The same problem occurs if the model for adjustment of series is changed in the beginning of the year.

There is a feature of Demetra that may restrict the number of changed observations in the series if the new observation is added.

Clear guidelines on transmission policies of adjusted series shall be established.

The scope of the guidelines:

1. The standard length of the adjusted series revised due to adding new observation.
2. The length of the adjusted series revised due to 1 + revision of K periods in the future.
3. Decision if the complete adjusted series shall be sent whenever the model is changed.

4. Quality of SA

The set of quality indicators proposed by Eurostat are very complex. But for practical reason we propose to concentrate on information that are understandable to wider range of users. For the same reason, the quality assessment could be limited to the most important series. In our opinion, the quality assessment can be done on yearly basis.

Finland

Suggested avenues of possible future STESWP work on the seasonal adjustment topic to further harmonise the seasonal adjustment methods applied at the national level

We propose STESWP to go through practices and experiences of different countries. Which methods of seasonal adjustment are the most used and how have they been realised? When Statistics Finland changed the applied method from X11 or X12 ARIMA to TRAMO/SEATS, we launched a project with the aim of implementing the new seasonal adjustment method in all statistics that use seasonal adjustments. A system revision was started in spring 2004 and the new series and historical data have been released since January 2005. The revision of the seasonal adjustment system required a lot of resources in the form of training, IT software, testing and realisation, but was very successful.

Korea

(i) The Korea National Statistical Office (KNSO) performs the seasonal adjustment practices in the almost same way of Eurostat guidelines. We can't carry out all parts of SA practice with alternative "A" – the best practice, but we are trying to do our best. We consider the alternatives suggested in the guideline as good examples. In the practical affairs, we sometimes face some barriers like time constraints and human resource shortage. In Korea, the SA practice is carried out once a year at the beginning of the year and has to be done in one month. Moreover the number of series seasonally adjusted of monthly industrial activities is 1,130 and those of the wholesale and retail sales index is 57 while the number of persons in charge is only 12. We are doing our best to improve the quality of SA series, but it is hard to care about every part minutely.

(ii) We think each individual draft guidelines already indicate the problems and issues through showing the alternative "C".

(iii) We know it is necessary to harmonize the SA methods in order to compare across the countries. However each country has its own characteristics and features that should be considered locally. We think that the general guidelines have to be made by international organizations, but the detail matters should be dealt with by each country's discretion. In our opinion, It's a better for international organizations to simplify the guidelines than to add detailed directions within the range that doesn't lower the quality of comparability across the countries.

Luxembourg

Luxembourg welcomes the work done by the Euroindicators Working group on the seasonal-adjustment guidelines and would appreciate a further going harmonization of the (trading day/working day/seasonal) adjustment methods by OECD Member countries and the non-member observers. Nevertheless, one shouldn't forget that the harmonized adjustment methods can only lead to good results if the raw data are of an adequate quality.

Netherlands

Some suggestions for possible future work on seasonal adjustment: discussing and exchanging experiences on practical problems, such as "Bridge-days". Due to lack of information, Statistics Netherlands ignores these, but they are essential in the pre-treatment phase, especially in December/January, as a result of which the seasonally corrected figures for these months are of limited use. How do other countries deal with this problem?

Geographically shifting holiday patterns. In order to take this into account, one would need information on region specific branches. Until now, Statistics Netherlands has ignored this. How do other countries deal with this problem? The length of the time series needed in relation to climatological patterns (what exactly is a "normal" winter?). What are the consequences of the supposed acceleration of global warming in this context?

Norway

Seasonal adjustment in Statistics Norway is done using X12ARIMA and we will switch to X13ARIMA in the near future. Generally we seek to base the adjustment on a thorough analysis of the adjustment of the series. However, due to the high number of series we do not always have the time and resources to perform sufficient analysis. Time series for the production volume index (Oil and Gas Extraction, Manufacturing and Electricity Supply), Index for Retail Sales, Labour market statistics and some series for the construction statistics are thoroughly analyzed.

Thus we mainly agree with the Eurostat Guidelines, which we regard as analysis based. Nevertheless due to the high number of series and limited manpower, it is not realistic to expect to be able to implement the guidelines for all the series we adjust.

Any specific problems/issues with any of the individual draft guidelines
We would like to comment on the following points:

Item 1.1: National and EU/euro area calendars and Item 1.3 Correction for moving holidays.

There exists a program <http://www.census.gov/ts/x12a/final/pc/genhol.exe> , which generates regressor matrices for use in X13ARIMA and X12ARIMA. This makes it more convenient to handle national holidays and generally national calendars. Thus it seems not necessarily very cumbersome to handle national calendars in X12ARIMA or X13ARIMA. Statistics Norway has also developed a similar program to handle the specific Norwegian Easter holiday. [This program runs the X12ARIMA for various combination of how many number of days before and after Easter should assumed to be influenced by Easter. The AIC-criterion from X12ARIMA is used to find the optimal combination of number of days.]

Item 2.1: Choice of seasonal adjustment approach (Tramo-Seats versus X12ARIMA, including consideration of recent development)

As mentioned above, we use X12ARIMA and the emphasis will be put on the analysis of the data series rather than changing to a new tool. However, in the near future we will move to X13ARIMA.

Item 2.3: Geographical aggregation: direct versus indirect approach and Item 2.4: Sectoral aggregation: direct versus indirect approach

We would like to add that the "composite" test in X12ARIMA might be used to decide whether to seasonally adjust on aggregated or disaggregated level. Furthermore, among others, the paper "Experience with Indirect Seasonal Adjustment" by Kathleen M. McDonald et al. (www.census.gov/ts/papers/jsm2005kmj.pdf) gives some methodological indications on when to seasonally adjust directly and indirectly.

Item 2.5: Data presentation (trend-cycles estimates, seasonally adjusted estimates, ...)

We agree, but would like to add that the trend for the last 13 months may be plotted with a different symbol than the rest of the period since the trend estimate has larger uncertainty for this period. This is explained by the fact that after 13 months a new observation is included in the computation of the seasonal component.

Item 4.1: Common quality measures for the seasonal adjustment

Please see the comment on Item 2.1 and the first section.

Item 4.2: Eurostat Quality Report for seasonal adjustment and Item 4.3: Template for seasonal adjustment metadata

No resources allocated to implement this yet.

Item 5.1: Seasonal adjustment of short time series:

Alternative B is chosen.

Item 5.2: Treatment of problematic series:

For very noisy series the seasonally adjusted series are sometimes smoothed.

Poland

The guidelines on seasonal adjustment practices are very helpful in the works on unification of the practices applied in seasonal adjustments by different countries. The structure of the guidelines has been appraised very positively due to the presentation of subsequent steps in the adjustment process, including the detailed explanation of its particular items. The presentation of actions in the layout, where different alternatives ("best alternative", „acceptable alternative" and „to be avoided") are covered, is also interesting. It enables to assess the practices that are used at present and gives the possibility to introduce the changes in order to elaborate the best solution.

Spain

Suggested avenues of possible future STESWP work on the seasonal adjustment topic to further harmonise the seasonal adjustment methods applied at the national level:

- Suggested seasonal adjustment method (TRAMO/SEATS vs. X12-RegARIMA) can be performed with different software (e.g. Demetra, Dos-Programs, Windows Programs). The output is not the same, even if the same adjustment method is used. Therefore a common software for each of the two methods should be suggested.
- Including multivariate adjustment procedures (e.g. Denton) directly in the seasonal adjustment software (to avoid use of different adjustment procedures).
- Short series: Because of NACE-Revision many series will be quite short (same problem in other countries??). For short series working day adjustment (distinction between working day – non working day) should probably generally be preferred to trading day adjustment (different weights for every single day).

Slovenia

Slovenia is one of the members of the Steering Group on Seasonal Adjustment (SGSA) which will propose the ESS guidelines, based on Eurostat guidelines. The first meeting was on 14th February 2007, where the working strategy was proposed. During the past months the proposals to Eurostat guidelines and metadata template were given. During the mandate of the SGSA the proposals will be summarized and a common proposal for ESS guidelines will be prepared, (General Methodology and Standards).

Statistics Italy

Comments about the specific issue submitted for consideration by STESWP participants of agencies in all countries:

(iii) The Eurostat draft submitted to the WP provides a first draft of a general framework setting the guidelines for seasonal adjustment in the European Statistical System; it must be considered that the draft is already undergoing a careful review of the members of the EU Steering Group on Seasonal Adjustment and a more refined version will be available soon. The framework adopted by the ESS can, in our view, become the basis for a new activity of the STESWG aimed at proposing a set of guidelines for the production (and dissemination) of seasonally adjusted indicators to be shared by member countries and to be proposed as international standard. This hypothesis can be discussed in depth at the WP meeting, both to verify if there is the interest of non-EU countries, and to settle the main elements of a work programme.

Sweden

The guidelines for the direct and indirect approach should be further discussed. Since Statistics Sweden is represented in the TF more technical viewpoints will be taken up in that forum.

United States – Census

(i) Possibility of Implementing OECD Guidelines at the U.S. Census Bureau

The Census Bureau recently developed a set of guidelines for seasonal adjustment diagnostics, along with a supporting document outlining specific steps to be taken in the setting of seasonal adjustment options within a production framework. The current draft of the OECD guidelines does not provide this level of detail, and as such would not be as useful as our current guidelines.

References for these guidelines appear below:

McDonald-Johnson, K. M., Monsell, B. C., Fescina, R., Feldpausch, R., Hood, C. C. H. and Wroblewski, M. J. (2006a). Seasonal Adjustment Diagnostics, Census Bureau Guideline 18_v1.0 U.S. Census Bureau

McDonald-Johnson, K. M., Monsell, B. C., Fescina, R., Feldpausch, R., Hood, C. C. H. and Wroblewski, M. J. (2006b). Seasonal Adjustment Diagnostics Checklists, Census Bureau Guideline Supporting Document 18A_v1.0 U.S. Census Bureau

(ii) Comments on Specific Sections of the Guidelines

1.1 – National and EU/euro area calendars

Additional text for Description Section:

Before starting the use of alternate trading day regressors (or other user-defined calendar regressors), they should be checked against two alternatives:

- no calendar regressors, and
- the default calendar regressors available in the seasonal adjustment software.

This examination should be done using available modeling diagnostics, examples of which include:

- likelihood statistics (such as AIC, AICC, and BIC);
- standard modeling diagnostics such as the Ljung-Box Q;
- spectral diagnostics for series that are long enough to estimate the spectrum of the series reliably (usually no less than 84 observations);
- out-of-sample forecasting performance.

1.2 – Methods for trading day adjustment

Additional text for Description Section:

Users should determine how the length of month effect is accounted for in the trading day model, whether it should be:

- included as a separate regression term or
- divided out of the series with length-of-month or leap-year prior adjustment factors.

A strong indication that the length-of-month regressor should not be used is to check the size of this coefficient to see if it is plausible – often outliers in February will inflate this coefficient.

1.3 – Correction for moving holidays

Additional text for Description Section:

Currently, the built in regressors for the major seasonal adjustment programs reflect the level of activity before a given holiday. In some situations, specifically the prevalence of an effect around Easter and Easter Monday in Northern European series that depresses activity, this type of model for moving holidays may not be effective. In this case, the use of proportional regressors generated for intervals before, after, and/or containing the holiday should be generated and evaluated.

The length of the holiday window – that is, the length of the period before the holiday that the level of the series is assumed to be elevated – should be checked periodically.

1.4 - Outlier detection and correction

Additional text for Description Section:

The types of outliers available in the major seasonal adjustment programs are

- Additive outlier: abnormal values at one point in the series
- Level shift outlier: a permanent change in the level of the series
- Transitory outlier: a temporary change in the level of the series
- Seasonal outlier: a very specific form of seasonal change (not broadly used)
- Ramp regressor: (not automatically identified)

Revised text for Evaluation of Alternatives Section: (suggested changes in *italics*)

A) The series should be checked for outliers of different types (see above) according to default options in the tool. Once identified, outliers due to data errors should be corrected. *Outliers not due to data errors should be modeled with and treated by the software.*

1.5 - Model selection

Revised text for Description Section: (replacement text)

Model selection pertains to the selection of appropriate transformation choice and regARIMA model selection. Transformation choices are log transformation (for a multiplicative adjustment) or no transformation (for an additive adjustment). Possible variables to include in the regression model are:

- Trading day regressors (either stock or flow)

- Moving holiday regressors, such as Easter
- Length of month/length of quarter/leap year adjustment
- Outliers
- Trend constant
- Seasonal regressors (available in X-12-ARIMA)

General Comments on the Evaluation of Alternatives Section:

Part C implies that selection based on a restricted number of pre-defined models that have not been tested for adequacy with the set of series being adjusted should not be performed. There is a procedure in X-12-ARIMA called pickmdl that does this. In theory, the automatic modeling procedure based on TRAMO performs better than the pickmdl procedure; however, there should be more research done to verify that it is indeed better.

Revised text for Evaluation of Alternatives Section: (replacement text)

A) Automatic selection of the transformation and regARIMA model according to the options of the tool. Check for model adequacy by looking at the spectrum of the seasonal adjusted series and the Ljung-Box Q statistics. For the most important series and/or the most problematic series, use the automatically selected model as a starting point and modify if a better model is available.

2.1 – Choice of seasonal adjustment approach

General Comments on the Options section:

Options list X12, TS, and X13A-S, but nothing else. “Other adequately comprehensive structural time series model software” or simply “other software” should be listed as an option, after X-13A-S. Later, in the evaluation section, it can be stated whether or not to use these software, but they need to be options before they can be evaluated.

General Comments on the Evaluation of Alternatives Section:

The Acceptable (B) alternative mentions that other comparable software could be used – list software packages that conform to this alternative, such as STAMP.

Then, in the To Be Avoided (C) alternative, could just say “use of production tools other than those listed in A and B”.

Guideline 5.1 can be referenced in this section, and state that decision on which software to use may also depend on the length of the series.

2.2 - Consistency between raw and seasonally adjusted data, including adjustment methods

Revised text for Options Section: (suggested changes in *italics*)

Do not apply any constraint.

Apply default constraining techniques (X-12-ARIMA).

Constrain seasonally adjusted annual totals to sum to original data annual totals.

Constrain seasonally adjusted annual totals to sum to trading day (only) adjusted original annual totals.

Apply other constraining technique, for example, the regression benchmarking technique of Quenneville, Cholette, Huot, Chiu, and Fonzo.

Revised text for Evaluation of Alternatives Section: (suggested changes in *italics*)

B) *Impose consistency* between raw/working days adjusted and seasonally/working days adjusted data under particular circumstances, i.e. requirements from users

2.3 - Geographical aggregation: direct versus indirect approach

Revised text for Description Section: (suggested changes in *italics*)

Seasonal adjustment can be performed at different geographical aggregation levels: SA can be performed at national level and then European total derived by aggregated national seasonally adjusted figures (indirect approach); alternatively seasonal adjustment can be performed directly on European total obtained by aggregation of national non seasonally adjusted or working day adjusted only data (direct approach). The debate concerning whether it is better to perform seasonal adjustment at the most disaggregate level and then aggregate seasonally adjusted data or to directly seasonally adjust aggregates data is still open.

Neither theoretical nor empirical evidence uniformly favors one approach over the other, *although diagnostics are available for checking the quality of the different approaches. The spectrum diagnostic for the direct and indirect seasonally adjusted series indicates if residual seasonal or trading day effects remain after adjustment, and if only one approach produces a good spectrum result, then it should be preferred. Additional diagnostics such as revisions history and sliding spans can indicate if the approaches produce adjustments of adequate stability.* For EU aggregates there is often a strong requirement of consistency between MS data and European-level data, especially when they are additively related (i.e. QNA, External trade, employment/unemployment).

Revised text for Evaluation of Alternatives Section: (suggested changes in *italics*)

A) *As long as it meets diagnostic requirements, use of the direct approach, for transparency reasons and in case of a lack of harmonization of national approaches. The centralized indirect approach is also recommended for special cases where the subsidiarity principle doesn't apply (external trade, unemployment)*

B) *The decentralized indirect approach within a common quality assessment framework, especially where there is a strong requirement from the users of additivity between national and European totals, or where the centralized indirect approach does not meet diagnostic requirements.*

C) *Use of the mixed approach especially when other methods than Tramo Seats and X-12-ARIMA are used at MS level.*

2.4 - Sectoral aggregation: direct versus indirect approach

Revised text for Evaluation of Alternatives Section: (suggested changes in *italics*)

A) *If a direct adjustment has been chosen for the geographical aggregation, use of both direct and indirect approaches for sectoral aggregation. The choice between the two approaches depends on a number of factors, among these the characteristics of data (correlation of single components, quality of basic data, etc.) and users' requests (e.g. consistency of components and aggregates); Otherwise only an indirect adjustment is feasible for the sectoral aggregation.*

B) *The use of a direct approach at any level complemented by benchmarking techniques (i.e. Denton's approach) to obtain consistency of disaggregated and aggregated estimates if the adjustments that arise from benchmarking are of adequate quality.*

C) *An indirect approach using different methods than X-12 and Tramo-Seats.*

2.5 – Data presentation issues

Revised text for Evaluation of Alternatives Section: (replacement text)

A) *Press releases should always contain raw data and SA series. However, raw data, seasonally adjusted and trend-cycle series should be available to users through Eurostat website. Concerning growth rate, period on period growth rates have to be computed on SA data while annual growth rates have to be computed on non SA data. The use of annualized growth rate is not recommended.*

B) *Present only seasonally adjusted data or seasonally adjusted as well as trend cycle for series with very high volatility.*

C) *The presentation of only the trend-cycle data as well as the computation of early growth rate on SA data.*

3.1 - Timing of revisions and re-estimation of Arima models and coefficients

Revised text for Evaluation of Alternatives Section: (to avoid double negative)

C) No re-identification/estimation of models or different timing from those under Alternatives (A) and (B).

3.2 – Concurrent vs. Extrapolated seasonal factors

General Comment on the Description Section:

Text about revisions needs to be more specific on which revisions are being described (monthly, annual, etc).

It is unclear what is meant by “No revision should take place between two consecutive revisions.”

Revised text for Description Section: (suggested changes in *italics*)

For the current year, seasonally adjusted data can be computed either by running the seasonal adjustment procedure every month/quarter or by using extrapolated coefficients once a year. In the first case, data are revised every month/ quarter. In the second one, data are not revised within the year but only once a year. In terms of accuracy, the first approach seems to be better, but the second approach is often preferred by users who do not like data to be continuously revised. The use of extrapolated seasonal factors can lead to biased results especially when unexpected events occur during the year. Revisions should be scheduled in a regular way and possibly according to the release calendar. No revision should take place between two consecutive revisions.

General Comments on the Options Section:

The second Option states that ‘all’ past adjustment values be updated with December revisions. At the US Census Bureau, data are not revised all the way back; often data from only a few recent years are revised. Removing the ‘all’ would make the statement more general.

General Comments on the Evaluation of Alternatives Section:

Alternative (B) is missing some information after the word ‘until’.

Revised text for Evaluation of Alternatives Section: (suggested changes in *italics*)

C) Use of purely extrapolated factors *except for special situations where the needs of data users dictate that these are necessary.*

4.1 - Common Quality Measures for Seasonal Adjustment

Revised text for Options Section: (replacement text)

Conduct analysis with and report quality measures specific to chosen software package.

Conduct analysis with and report only the quality measures common to both Tramo-Seats and X-12-ARIMA

Conduct analysis with all quality measures available in chosen software package, but only report common diagnostics.

5.1 - Seasonal Adjustment of Short Time Series

General Comments on the Options Section:

Vague quantifiers are overused in the entire section – Is there a definitive number of years that make a series “too short.” The term “short” seems to refer to less than 10, but too short is never defined.

Option 1 states: “Do not adjust time series when they are shorter than the minimum requirement,” but no minimum requirement is established. The options should document 3 years as the minimum requirement

in X-12-ARIMA, and include a suggested minimum for TRAMO/SEATS. Also, instead of starting the option with “Do not adjust,” substitute “Not adjusting.”

Option 2 should define “alternate procedures”.

Regarding a comparative analysis to determine which program better suits certain short time series, a set of possible rules on which to base the final decision would be helpful. If everyone is adjusting their short series on different criteria, then these guidelines are establishing inconsistencies.

Revised text for Evaluation of Alternatives Section: (to avoid double negative)

C) Use of non standard tools for short time series.

5.2 - Treatment of problematic series

General Comments on the Options Section:

Even though it is an option to be avoided, “Implement regular seasonal adjustment procedures for all problematic series” is missing from the Options section.

Consider replacing all instances of “ad hoc” with “case by case seasonal adjustment.”

General Comments on the Evaluation of Alternatives Section:

Alternative (A) is worded very poorly. The description of your best alternative should not start with “If other alternatives fail.”

Alternative (B) seems to be missing “Ad hoc” at the beginning of the sentence.

Revised text for Evaluation of Alternatives Section: (to avoid double negative)

C) Seasonal adjustment performed in automatic way for all problematic series.

Areas of Future Improvements / Research / Collaboration

- Establish rough guidelines on which diagnostics to use to select a model with shorter time series.
- Develop methods of modeling and adjusting for moving trading day variation in economic time series, along with more research in the estimation and modeling of calendar effects in general.
- Further research to develop and evaluate common diagnostics for X-12-ARIMA and TRAMO/SEATS seasonal adjustments.
- Further research on automatic model selection.
- Further studies of seasonal adjustment program (X-12-ARIMA and TRAMO/SEATS) performance for different types of short series.
- Allow other agencies to evaluate and comment on the Eurostat Quality Report for Seasonal Adjustment mentioned in Section 4.2.
- Allow other agencies to evaluate and comment on the standard template for SA Metadata developed by ECB-Eurostat Task Force on Quarterly National Accounts mentioned in Section 4.3.