



OECD SHORT-TERM ECONOMIC STATISTICS WORKING PARTY (STESWP)

**Country comments on OECD paper:  
Revisions analysis of the index of industrial production for OECD countries  
and major non-member economies**

Paper prepared by Richard McKenzie  
Statistics Directorate, OECD

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## **STESWP 2006 – Country comments on OECD paper: Revisions analysis of the index of industrial production for OECD countries and major non-member economies**

### **Norway**

#### **General comments**

Statistics Norway regards the revision analysis done by OECD as important and very useful both as a comparison between countries but actually even more as an analysis on Norwegian data. In Statistics Norway the most comprehensive study on revisions in official statistics was done back in 1990 with the work of Mæhle<sup>1</sup>. The study was dedicated to revisions in the national account. Statistics Norway is at the moment conducting a new revision study for the Quarterly National Account (QNA) focusing on benchmarking the QNA with National Account (NA). This will also give feedback on short-term statistics used as indicators in the QNA.

#### **Revisions in the Norwegian IIP**

The Norwegian index of industrial production (IIP) is a monthly index made public the fifth working day one month after the month covered. The IIP is a chained Laspeyres volume index with annual links. Value added at factor cost from Industrial Structural Statistics is used as basis for calculation of weights. Structural data is projected by figures from the quarterly national accounts. The frequency of weight update is once a year and implemented for the index of January. The IIP is an input to QNA for the calculation of GDP. The IIP is not benchmarked against any structural statistics or NA but a yearly comparative study between IIP, QNA and Industrial Structural Statistics is done as a process of evaluation.

Working Day Adjustment is the only pre-adjustment of the input-series in the seasonal adjustments. No manual adjustments are taken. A multiplicative seasonal adjustment model is in use for all the published series. The seasonal filter is automatically selected according to the X12 procedure. Seasonal factors are normally calculated with treatment of outliers or extreme values.

The span for updating old figures goes back to January 1995. For aggregated series the direct approach is used, the only exception is made for the total index (NACE 10 - 40) which is adjusted indirectly based in the aggregated series for "*Oil and gas extraction*", "*Manufacturing, mining and quarrying*" and "*Electricity, gas and steam supply*". The use of indirect approach for the total index was decided in July 2000, and updated series was calculated back to 1995.

There are two main causes of revisions in the IIP. The most important one is the incorporation of monthly updated seasonal factors. This is done for all series in IIP back to 1995. This is also the main explanation to the major revisions in IIP series which took place in October 2000, December 2002, May 2003, June 2004 and June 2005. In October 2000 the updated seasonal factors for June,

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<sup>1</sup> Mæhle, Nils Øyvind (1990): Kvaliteten på foreløpig nasjonalregnskapsstatistikk. Økonomiske analyser nr 7 /1990. Statistisk sentralbyrå (Quality aspects in the preliminary NA)

July and August back in 1998 and 1999 changed dramatically. The revisions in seasonal factors that took place in May 2003, June 2004 and June 2005 seem to concern mostly the Easter problem in seasonal adjustments.

The other cause of revision is incorporation of data from late respondents, and incorporation of more complete and more accurate data from initial respondents. The sample of establishments is updated yearly in January using PPS-sampling procedures. The new information from new establishments is not always in place for the January index, and as a consequence it is decided to keep the rule of release (the fifth working day in  $m+1$ ) but if necessary update and revise the index for January in February each year.

## **Luxembourg**

Statec Luxembourg has not remarked large inconsistencies between the revision analysis performed by OECD and some minor studies carried out by our own office. The main reasons for revisions of the IIP in Luxembourg are the incorporation of data of late respondents, the correction of (wrongly) estimated data, the use of different methodologies for the calculation of the first estimates and the official releases and also long-term revisions (of data and/or of methodology).

In Luxembourg, the first estimate (flash indicator) for the means of Eurostat and SDDS is published after 6 weeks, these results are based on a sub-sample of industrial units. The official publication (in 'Indicateurs rapides du Statec') is normally after 2 months.

Revisions are considered as 'qualitative improvements', the last result being always better than the previous ones. The large revisions are due to the structure of the very small industrial sector: correcting the estimated production of one or two larger units (responding after the delays) can lead to large revisions in the total industry results. Nevertheless, the mean absolute revision to first estimates as well as the timeliness have been significantly reduced.

Concerning the IIP growth rates and those of value added in industry, it must be said that those are largely due to the fact that mostly gross output quantities in physical units (kg, m<sup>2</sup>, tons, etc.) are used for the compilation of the IIP. IIP measures gross production and not value added: this indicator can therefore only be considered as an estimator for value added and not as a reliable measure of value added for infra-annual statistics.

## **Japan**

As a part of our comments for the paper on Item 3, we would like to introduce our actual situation. In Japan, the Expert Group Meeting on Statistical Indicators, which is a forum to exchange opinions and to discuss some issues on statistical indexes compiled by Laspeyres methodology mainly, is established in the government. The members of the meeting are consisted of experts with the academic background and staff members of the official statistical organizations. Two sessions for one index are held to deliberate the plan and result of the revision when each

statistical index is revised. Following issues are discussed every revisions; revision of the base year, weight, methodology of the seasonal adjustment, classification. In general, the indexes are revised every five years (in the year 00 and 05). The adoption of new data source and new statistical methodology are also discussed deliberately among the members.

As two sessions are held for each index, if each organization compiling index is asked to respond to and address some inquiries or provisions submitted in the first session (revision plan meeting), they must report and respond to these issues in the second session (revision result meeting).

## **United Kingdom**

This is a really good and well written paper which should be of long term benefit to users and producers of the IIP statistics across the world. The initiative it describes is strongly supported by the UK. Some general comments follow:

The paper appears to be still using the methodology which the UK questioned in last year's DiFonzo paper. The UK wrote to OECD about this and a conversation that Graham Jenkinson from ONS had with Paul Shreyer and others suggested that OECD accepted the validity of the UK's comments.

The UK is surprised that the YoY growth rates for the UK are significant (i.e. biased). This is at odds with the UK's own analysis. It may be that the differences occur because we use a different test of significance (see above). We will test this, and report back to the STWSTP in June. The conclusion that improved timeliness does not necessarily lead to greater revisions is undeniable as an empirical observation. However, there may be reasons for this. It may be for example, that the accuracy or relevance of the estimates is what takes the hit of improved timeliness, even if reliability (i.e. revisions) improves. Alternatively, countries may simply choose not to revise, in which case reliability is improved, but overall quality may still be worse.

A factual point on the UK's use of benchmarking: we don't benchmark the UK's IIP to the national accounts estimates. In fact, the IIP is taken as the definitive estimate of output of manufacturing industries, and effectively the national accounts is benchmarked to the IIP.

The IIP in the UK is revised primarily because of the inclusion of late data on prices and turnover (and their impact on re-seasonal adjustment). However, there have also been some significant methodological changes in recent years which have affected the IIP, principally the introduction of annual chain linking in September 2003. While the IIP in the UK is not benchmarked to the annual national accounts (and is taken as the definitive source of data on industrial output), the monthly survey data are reconciled with the annual source at the level of unit data. This 'congruence' exercise can also give rise to some revision. The correction of (non-statistical) 'errors' is not a source of material revisions in the UK.

The UK is keen to use revisions analysis as the basis of identifying improvements in survey processing. Regular analysis of the reasons for revisions is carried out for all national accounts estimates (including the IIP).

An observation about the last sentence on page 2. This result does not surprise me as the year ago estimate is already fairly mature. So revisions to the YoY growth rates will be driven mainly by revisions to the latest estimate. However when looking at MoM growth rates both estimates are fairly recent, so subsequent revisions to the growth rate may be generated by revisions to both of them.

Experience in the UK suggests that revisions analysis can be very sensitive to the time period chosen for the calculation of results. It may be worth testing this on the wider OECD dataset (running analysis of bias, say, on various time-windows). It may also be useful to establish if there is an impact from 'outliers' (i.e. very large revisions, which may be unlikely to reoccur). For example, in the UK, the largest revision to the IIP in recent times coincided with the 'Queen's Jubilee', which had a very marked impact on the index in June 2002. If revision analysis is to be used as a tool to identify systematic causes of revisions, then the removal of such non-systematic revisions may help.

## **New Zealand**

3. The analysis is useful from a cross-country comparison perspective, and the author has correctly highlighted the major generic causes for revisions to such series. The one substantive point from a New Zealand perspective is that the revisions presented for New Zealand are likely to be understated where our quarterly GDP numbers are concerned, since the analysis only looked at revisions 2 years out, and our practice for benchmarking to our latest balanced year means that this happens approximately 3 years after the first release. A suggestion then would be to look at extending the analysis out to 3 years (in which case the NZ results might not look as "good" as they do).

4. Without knowing exactly how our QGDP estimates are used it is difficult to comment on what they have found regarding revisions. To be fair to the publications of our data and their analysis, understanding how they create their index from our data would be necessary. It would also be interesting to compare QMS with manufacturing in QGDP but such comparisons, in the absence of the completion of the work we have started on gross output, would be difficult.

5. From a methodological perspective, it is noted that NZL revises about 80% of the time with the same sign (p.13, fig 5). If one has small growth rates for the same errors, then one is more likely to move from +ve to -ve movements than someone with large positive (say) movements but whose movements are large enough to cover any revisions so they won't change sign.

## **Germany**

Generally, we welcome this very detailed analysis of revisions for the IIP. Actually, we monitor the revisions for the IIP very carefully, and we introduced a new method at the beginning of this year in order to reduce the extent of our first revision (which was made only 15 days after the first release). We appreciate this work done very much, and the results for Germany seem reasonable so far. In detail:

### Issue 1:

We made quite a similar study for the period 1999 to 2002 (however, we used gross data instead of seasonally adjusted data as we did not want to consider the effects of the re-estimation of seasonal factors in the analysis). The results in the Excel sheets for Germany for this period seem reasonable and more or less coincide with our findings. Due to a substantial change in the method of the calculation of the German IIP we had to make large-scale revisions in 1999. They were mainly caused by the introduction of a new benchmark procedure for the monthly index (since that time the monthly index has been benchmarked by the quarterly production census). The break in levels (see Excel sheet Germany\_Revision\_Triangles.xls) from July 2004 onwards was caused by the introduction of the new base year 2000.

### Issue 2:

Basically, we revise the monthly IIP for the following reasons: The data published for a given month are revised in the context of processing the data for the next month. This correction is necessary due to data errors and to the late arrival of business data. The second revision takes place as a so-called “quarterly correction” approx. 2½ months after the reference quarter. In order to use the quarterly IIP as a benchmark for the monthly index we revise all related months backwards whenever data of the quarterly production census become available, which is normally 2 to 3 months after the given quarter. This revision is not fixed in time and would not be explicitly commented in the relevant press release. The fact that we use the quarterly index as benchmark for the monthly index tends to result in an minor upward revision of the monthly index. We do not think this is a serious quality concern regarding our index.

The last revision is the annual correction which is made after the data preparation of the 4<sup>th</sup> quarter has been completed. This last revision, which encompasses the (data) correction of the year, takes place around March of the following year.

In addition, more general reasons for revisions are the introduction of a new base year and the reestimation of seasonal factors. Referring to the new base year 2000 we re-calculated the index from 2000 onwards according to the new weights (producer prices, production values, value added). We started right from the beginning of the index calculation procedure (starting with value relatives).

### Issue 3:

We regard such revision analysis as very useful as we generally intend to satisfy user needs for a more transparent revision policy. We think that the measures used in the analysis are useful from a user’s point of view and we would welcome the idea to make the tools freely accessible.

## **Greece**

NSSG follows a certain procedure for the compilation of the Industrial Production Index every month. The Index includes, on the one hand all the available data by the enterprises of the sample by the time of the compilation process and, on the other hand estimates for those that have not respond yet. Following that, the first publication of the current index is provisional. Then, along with the compilation of the next reference month, data from late respondents or revised data from initial respondents are incorporated in the initial index and the IPI is being revised and characterized as definitive. The software in use for the compilation of the IPI provides the

possibility to replace or re-compute input data whenever the user regards it as necessary during the reference year. At the end of each year, the data are being finalized. At that time, the IPI for the respective year becomes definitive.

The reasons that cause revisions of data outlined in this paper could be applied in the case of the Greek Industrial Production Index. The most frequent case refers to the incorporation of data from late respondents and to the reception of more complete and accurate data from initial respondents, as, due to the timeliness achievement reason, there is a need to compile the index with the toleration of lower response rates. In the long run, updates of the base year would definitely cause revisions in the IPI. Moreover, revisions could be the result of changes in statistical methodology, concepts, classifications, but this is a rarer phenomenon.

The revision analysis presented in this paper is quite comprehensive and can become an important tool in the ongoing process of a NSI to enhance the quality of an index. According to this analysis about IPI, we would like to comment on some issues.

First of all, we agree that, on the one hand, the month-on-previous month growth rates for the IPI provide a reliable indicator of whether industrial activity has expanded or contracted, but nothing further. As the analysis shows, the initial estimates of the month-on-previous month growth rates are apt to being revised by two thirds of their original value within the first year. On the other hand, year-on-year growth rates are a robust measure of the current rate of expansion or contraction of industrial activity in economy.

Especially in the case of Greece, one must take into consideration the special characteristics of the Greek industry. More specifically, the divisions that account more for the IPI are the “Coke and Petroleum” (div. 23 of NACE) and “Food and Beverages” (div. 15 of NACE), which are characterized by great fluctuations between successive months. In the case of coke and petroleum, the production is influenced at great extent by its price in the stock market, whereas in the case of food and beverages, weather conditions and seasonal consumer behaviours cause changes in the size of production. Thus, Greece puts emphasis on the year-on year growth rates. As a consequence, the statistical significant mean revisions for month-on-month growth rates do not influence on the wrong way the quality of the index.

In the issue of timeliness of the IPI, we would like to state that Greece delivers data to Eurostat within 40 days after the end of the reference period for the last year. Furthermore, from the mid of 2003 till 2005, the dissemination was done within 42 days. As a result, we disagree with the notion in the paper that states that Greece improved timeliness from 2.5 to 2 months between the two periods before and after June 2002.

Moreover, the issue of coherence of the IPI data with the national accounts data is regarded important and is examined thoroughly with the responsible departments. Some discrepancies, between IPI and gross output from Annual National Accounts, that have been detected at the 2-digits are due to the fact that N.A. include all industry, while the IPI includes enterprises with more than ten persons employed. It has to be noted that the Greek industry is characterised by a large number of small enterprises.

NSSG wishes to be informed about the source of the data used in this paper before 2000. This matter is in contrast to the reference in the paper “Review of linking practices for the Index of Industrial Production in OECD countries” that for Greece data are available only from 2000 onwards. It would be very useful, if you could send us those data (1999-2000) before performing the seasonal adjustment. It could be also helpful if you provide us with information about the

method you used in the linking of the two series, as to compare it to our own data. Furthermore, we would be interested in receiving more information about the seasonal adjustment method in use.

Overall, the revision analysis as a procedure and the presentation of the results, mainly through charts are very useful tools for the thorough examination of an index and the assessment of the quality aspects of this index. The revisions analysis spreadsheets, that OECD provides, enable the inner understanding of the computations done and can form a basis for the countries in order to be able to perform such revisions analysis themselves. Such efforts, which are accompanied by practical applications, are very helpful especially for those countries, which possess little experience in revision analysis.

## **Austria**

The revisions analysis is interesting, especially with regard to quality and timeliness (e.g. reliability of flash estimates). Yet, it should be harmonized with existing EUROSTAT policy as the existence of two parallel concepts may lead to misunderstandings and confusion, contradict the overall goal of international harmonization and is time-consuming and costly. EUROSTAT recommendations concerning revisions policy should be included in the OECD revisions analysis. Release dates should be coordinated with Eurostat. The maintenance of a revisions website would be time-intensive and cost-intensive. Statistics Austria favours concentration on harmonized and coordinated release dates.

Statistics Austria cannot reproduce the results stated in the OECD revisions analysis table as national calculations led to other results. We recommend using the seasonally adjusted series sent to EUROSTAT and OECD by Statistics Austria, which are available since the year 2000. Deviations until 2001 of estimates after two months from estimates after three months are not plausible to us because  $t+60$  data have not been published before that time. Statistics Austria sent data with a delay of about 3 months because of the delayed entry into force of the national Regulation. Methodological changes have not been undertaken at that time.

The revisions policy in Austria is as follows: at  $t+60$ , 75-80% of the data is available, the results are revised at  $t+90$  (~90% of data available) and in the month October of the following year (99,9% of data available). In between, the data is only adjusted if more significant inconsistencies (e.g. respondents adjust their data ex-post) could be found. The introduction of early estimates ( $t+30$ ) for selected aggregates is planned by next year. Because of the lower coverage at that time, we expect higher revision, depending also on the quality of estimation techniques.

**Ad Figure 6:** We would like to note that the index has been published at  $t+60$  since 2001, which lead to a more noticeable reduction of the time span between the end of reference period and publication than stated in the chart.

**Ad 7.1.:** The theory that there is no trade-off between timeliness and accuracy by improving at the same time the statistical production process sounds interesting. Yet, it seems arguable taking into consideration the underlying assumption such as comparability of the statistical production process or of the reasons for revisions. It would be interesting to know also the improvement in timeliness in days for the observed countries and how this improvement is achieved

(improvements of the production function? shortening of the deadline?). Also, the study does include a very small number of countries as it was mentioned that there were too many gaps in the publication frequency of other countries. It might be informative to observe results after a time span of 2 years to see if the theory holds empirically after that time as well. It would also be interesting to know the reference years of the study and to receive more material about the study performed. A follow-up study should include more countries over a longer time span and release information about the reasons for revisions as well as about how a reduction in timeliness is achieved and of which size.

## **Slovak Republic**

- At present SO SR does not realize the revision analysis similar to the presented one, therefore it is quite difficult to comment the results. We started to analyse the coherence between quarterly value added data and IIP. This analysis was not finished yet. In any case we consider the doubts on quality of IIP in paragraph 39 as premature. There is the need to make more detailed concept analysis of the both variables.
- IIP is revised on quarterly basis. It means, the monthly data for 2 previous months of particular quarter is revised/adjusted. IIP is compiled on the base of volume production data for representative products, therefore a detailed analysis of all changes for particular representative products is realised.
- We consider the revision analysis to be really important. In the past our first priority was to implement the short-term statistics in line with the EU requirements. Our future priority will concentrate on the quality improvement of present measures. Therefore we appreciate the effort of OECD to provide NSI with the tool for performing of revision analysis.

## **Poland**

Revision analysis of industrial production data is rather detailed. We confirm that revision of industrial production index in Poland is indeed very low. Usually, the reason of industrial production index revision is change of price index, which takes place in the next month after preliminary data. Revised data are disseminated according to established release calendar – 60 days after reference period.

In our opinion such revision analysis, which compare the level of revisions between countries may be very important in evaluation and improving quality of short-term statistics. Moreover, chosen for analysis intervals 3-month, 1-year and 2-year are sufficient for revision analysis of industrial production index, because they show the changes both in short and in long time.

Timeliness and accuracy, which is connected with data revision, are very important components of quality. Generally, there is conviction that improving timeliness may cause deterioration in data accuracy and at the same time - more revisions. In the meantime carried out analysis provided, and the CSO of Poland agrees with it, that there may be short timeliness and at the same time small revisions. Industrial production index in Poland is characterized by short timeliness and low

revision. Moreover, industrial production indices are carefully checked every month by specialists in the scope of their quality and accuracy.

Additionally, concerning *item 3 - Revisions analysis of the index of industrial production for OECD countries and major non-member economies*, we would like to inform that it is difficult to identify the source data for Poland, which were used in analysis and presented in the Excel spreadsheets on the Internet web-site indicated in the document. After comparison of the national data (month-on-previous-month and year-on-year growth rates) and those transmitted to Eurostat (from the Newcronos base) with the data presented in this document, we have affirmed that there are discrepancies between the data. Therefore, we are asking for indicate what was the base for these indicators calculation.

## **Bank of Italy**

As general remarks, I surely find very useful the revision analysis provided in the paper, mainly as an incentive for fostering progress in the source and validation of basic data in order to improve both accuracy and timeliness. From a methodological standpoint, I however see a kind of “moral hazard” issue in stressing the size of revisions as a direct proxy for quality of the industrial production indexes, potentially leading to a strategy by purpose aimed at minimize the frequency and the magnitude of the revisions rather than at a clear and full transmission of all basic information, possibly available at different dates, to the statistical data. Also the procedure adopted in the season and working day adjustment may play a role in affecting the size of the revisions independently of the quality of the underlying raw data.

As a user, I would attach a major importance to the requirement that the revision strategy is clearly announced and transparently performed by producers. At the same time, I would stress the benchmarking based on the coherence with industrial value added within national accounts as a way to improve reliability for a prompt detection of cyclical developments. In this respect, I would like to address the important difficulty that in some European countries would come from the recent shift to chained volumes in national accounts against a practice to keep updating every five years the weighting scheme in industrial production index. Coherence would also call for ensuring equal treatment of seasonal factors and working day adjustment between industrial production index and value added.

## **ISTAT**

Istat comments about the four specific issues submitted to STESWP participants:

1. As far as the month-to-month and year-to-year changes are concerned, the results presented in the paper on the revision of the Italian index of industrial production are fully consistent with the ones developed at Istat. In turn, the seasonally adjusted indexes show shifts in level probably caused by a modification in the linking procedures.

2. In Italy the revision process of the IIP has been changed in October 2004 (with the release

concerning the August 2004 data), introducing a revision policy more articulated than before. In the current practice, three sources of revision can be identified:

- a) data arriving from late respondents;
- b) effects due to corrections of errors, either caused by the incorrect internal treatment of source data or resulting from wrong information previously provided by respondents and replaced later on (very often after direct contacts with the respondent);
- c) the revision of statistics (external to the survey) utilised in compiling the IIP: productivity coefficients (calculated as value added per standard unit of labour drawn from national accounts) are utilised in selected sectors where the output is evaluated measuring the labour input (hours of work); those sectors account for about 7% of the total industrial production in the base year.

The revision policy is clearly stated in the IIP metadata and proceed as follows. The first revision of indexes (based mainly on information provided by late respondents) is released after one month, when the new current month statistics are published. A second revised version of the indexes is released at fixed points in time: in April (releasing February data) and in October (releasing August data). The April release takes into account all the sources of information listed above, and in particular the revised version of yearly National Account estimates (released in March) concerning the previous three years. In October only the sources a) and b) are considered, revising IIP indexes referring to the first semester of current year. It must be stressed that the current revision policy is different from the previous one (adopted up o September 2004): then comparisons over different periods of the size and characteristics of IIP revisions can be strongly influenced by such a break.

3. Istat welcomes the work developed by the Secretariat concerning the revision analysis: the paper presented provides a very interesting review of the specific situation concerning the industrial production index and, even more, develops a valuable toolkit of revision analysis that can be very useful to standardise the different approaches that are emerging in this field.

4. Concerning specific aspects of the analysis presented in the paper, the following comments can be added:

- a) The revision analysis refers only to a particular aspect of the accuracy: the reliability or stability. Revision of subsequent releases is easily quantifiable compared with other quality dimensions, but it might be an ambiguous measure of quality, as an indicator may be very stable but inaccurate due to poor data sources. This should suggest a major caution in drawing conclusions about the accuracy of IIP indicators considered in the analysis.
- b) Reliability of first estimates of month-on-previous-month growth rates as a signal of the direction of the cyclical evolution of industrial activity is assessed by the share of months where the first estimate of monthly growth rate has the same sign of the one published one year later. A drawback of this measure is that it depends on the smoothness of the seasonally adjusted data: the sign of the rate of change of the IIP in a specific month (i.e month  $m$  over month  $m-1$ ) is likely to be more persistent if the series is very irregular, while a smoothed seasonally adjusted data can be characterised by relatively small (close to zero) monthly changes that can easily undergo switches in their sign.
- c) The limitation of considering only seasonal adjusted series, without disentangling the two components concerning the revision of raw data and the revision of the adjustment model,

must be made clear at the onset of the analysis, encouraging NSIs to pursue this specific aspect .

## Canada

The paper “Revisions Analysis of the Index of Industrial Production for OECD Countries and Major Non-Member Economies” indicates the intention of OECD to develop a website that provides appropriate context regarding the causes for revisions and highlight the need for NSO to develop a transparent revision policy. We feel that appropriate information about revisions can only translate into higher credibility of the statistics.

The paper invites countries to provide comments on the reasons for revisions to their IIP and to outline aspects of their current revisions policy. In November, 2002, Canada has released a manual on sources and methods for the compilation of the monthly GDP by industry (Catalogue no. 15-547- XIE). The revision policy for the monthly program is covered as well as several aspects related to revisions. Some points of the document are reproduced below. The goal is to illustrate the kind of detailed information that is required to do a proper analysis of the revisions. Also, the text attempts to give a good feel for why Canada decided to release revised GDP/IIP statistics sooner than later.

In Canada, IIP is produced monthly by the System of National Accounts Branch along with the other components of the monthly GDP by industry statistics. The monthly GDP /IIP calculations are preliminary, consequently, subject to revisions. In addition, the monthly data sources are incomplete in the sense that they do not provide all necessary information on outputs and intermediate inputs for calculating value added. More, these raw data are often revised for few months after they are first released.

Monthly estimates of GDP are based on a set of projectors and a fix relationship is assumed between inputs and output. Of course, when IO benchmarks become available, the GDP results are adjusted to reflect any change in this relationship. Until the IO benchmarks become available, the focus is on the growth rate. A first set of revisions to GDP/IIP statistics are coming from the current indicators and the underlying assumptions of the program while another set of revisions is due to the availability of more robust statistics - benchmarks.

When estimates of GDP/IIP are prepared for the current month, several of the preceding months are revised. After the annual revision process where data are revised over a period of 5 years, monthly revisions are carried back to January of that year until the next annual revision process is finalized. The two main reasons for revising the statistics is first to include any revisions in source data. In Canada, they are normally revised for month's  $t-1$  and  $t-2$ . The second reason is related to seasonal adjustment. Seasonal factors are less reliable near the end of the time series than in the interior. Consequently, to ensure revisions for seasonal adjustments are captured quickly, monthly revisions are carried back several months. The Canadian experience is that even though some series are subject to large revisions, the story at the detail level seldom change and the revisions at the aggregate level are small.

In fact, the revisions are generally random and decrease in time. The largest revisions usually occur with the month of December because of the closing of the calendar year revisions and the seasonal factors which tend to be more significant than other months.

Adjustment to source data can also play a role in the revision process. Every month, the GDP/IIP results are confronted to a set of related indicators. Often, to ensure the coherence of the GDP/IIP projectors and indicators, it is necessary to adjust source data. In Canada, the adjustments are normally done in a way that the annual level of the projector is not affected. We believe that even though data for certain months look suspicious, the value of the twelve months altogether is of good quality. Consequently, an adjustment to source data for a given month is normally offset by an adjustment of an opposite side in another month. There are cases where monthly data are benchmarked to similar data obtained from annual surveys, manufacturing shipments for example. During the annual revision process, the adjustments are removed, the seasonal adjustments is rerun, causing revisions. There are cases where adjustments must be re-incorporated in the monthly source data. However, they are normally smaller and the seasonal factors of the series tend to be much more stable. These aspects of adjustments could be expanded in section 5.2.2 Adjustments of the compilation manual.

The Canadian approach to revisions is done in two phase. In a first phase, short-term, revisions are released as quickly as possible to reflect corrections to source data and to incorporate better seasonal factors. In a second phase, the data are benchmarked to annual control totals produced by within the SNA. The goal here is not to sell the Canadian approach to revision but to emphasize the type of information that is required to study revisions.

## **Denmark**

In Statistics Denmark we have not done much of revision analysis. In a small organisation like Statistics Denmark it is very hard to get time to this. However we find this sort of study very useful.

But the focus from OECD – and certainly the poor correlation results for Denmark - implies that we will look closer to the analysis in cooperation with the national accounts. In cooperation with the national account we will try to find major explanations. For your information the national account only for the first version of the quarterly national account use the tendencies from the production index, in later versions other sources are used.

We are just in the middle of a major reorganisation of the statistical production process of the industrial production index. The reorganisation includes changing sampling- and enumeration methods, change of editing method and change of model for seasonal adjustment. We expect to publish figures on the new method later this year. Having completed this we will take up revision and correlation aspects.

## **U.S. Bureau of Labor Statistics**

As a general comment, BLS analyzes revisions every time data are revised and considers such analyses very important. For example, in the Current Employment Statistics program, research is done to determine potential reasons for the revision, and tools are used that are similar to those described in the paper on industrial production.

## **U.S Federal Reserve**

The Federal Reserve Board (FRB) reviewed the Revision Analysis of the IIP for OECD countries and had no comments. They did note, however, that for Figure 6 “Although the text clearly states that the lag shown is in terms of the MEI, the actual lag for the Federal Reserve’s IP index is ½ month, not one month. The index would be very different if, in fact, the lag was one month rather than a half.”

## **India**

12.2 The production index (index of industrial production or IIP) is released by the CSO at the end of 42 days. The first and final revisions in the IIP data take place after 72 days and after 132 days.

## **Czech Republic**

Problems of frequent revisions are particularly important and inconvenient for users while statisticians mostly give priority to the precision of data. There is no common revision policy for all short - term statistics in Czech Statistical Office and the methods of revisions depend on methodology, frequency of survey as well as user demands. So far the methods of benchmarking to the National account results and annual results are used rarely. In market services we started to benchmark quarterly data of employment and basic economic financial indicators with results of annual structure business statistics (SBS), mainly due to the fact that annual structure business survey cover all size of enterprises while quarterly survey collect information only for enterprises with 20 and more employees.

At the beginning of 2006 Czech Statistical Office changed the methodology for calculation of the Industrial production index with effect from January 2006. To maintain the possibility to analyse development in industry, the CZSO recalculated time series according to the new methodology backwards since 2000. From internal analyses made it resulted that the methodology for the Industrial production index used before was no longer suitable, because the set of products-representatives, from which it was arising, has become outdated prematurely. Internationally accepted IPI concept enables to use a rather large scale of methods as well as input data used. In accordance with experience from abroad, such alternative of calculation was now chosen, in which input calculation of individual indices starts at a higher level of aggregation.

However, on that level, it is not possible to combine different physical units of measure and thus it is necessary to rely on monetary indicators adjusted for inflation. As a suitable basic indicator the following usually surveyed indicator was selected: sales of own goods and services of industrial character in constant prices, which can be used as approximation of the volume of production.

## **Sweden**

### **Question 3.**

Statistics Sweden regards the described revisions analyses important for evaluation and improvement of the quality of short-term economic statistics.

### **Question 4.**

We should exclude these months when a change in method or change in reference base year (base year in the paper).

In Sweden Industrial Production Index was published as a fixed weight index, base year 2000, until reference period December 2004, only published once with the methodology. It was seasonally adjusted with X-11-ARIMA.

Since the publication of January 2005 Industrial Production Index is an annual chained Laspeyre index. It is seasonally adjusted with TRAMO/SEATS.

The main part of revision after year 2004 is the change in methodology.