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Linking National Accounts Series

MAINTAINING CONSISTENT TIME-SERIES OF NATIONAL ACCOUNTS.

Introduction

1. This note summarises some of the problems faced by OECD countries in maintaining consistent time series of national accounts. It describes country practices with regard to "regular" and "benchmark" revisions and methods used by these countries to "back-cast" estimates following major changes in the national accounts system or the availability of new sources of data. The methods used by these countries are relevant in considering how to improve the consistency over time of national accounts statistics in the ESCAP region.

Revisions

2. The main reasons why national accounts need to be revised are:

- More complete information becomes available from existing surveys or administrative sources;
- New data sources become available or old data sources disappear;
- New and better methods of estimation are devised;
- Changes in classifications;
- Changes in concepts and definitions - especially new international guidelines;
- Changes in bookkeeping conventions or other regulations affecting administrative data.

3. Most OECD countries make two kinds of revisions to their annual national accounts. These can be described as "regular" and "benchmark" revisions.

Regular revisions.

4. Statistical offices are generally under pressure to publish national accounts estimates before all the basic data on which they are based have become available. These preliminary estimates then need to be revised some months later when a more complete set of basic data is available. In some cases when these revisions are being made to the latest year, the national accounts compilers may realise that revisions also need to be made for earlier years. The general rule, however, is that regular, annual revisions are only taken back for a limited number of years even though, strictly speaking, the revisions may apply to earlier years as well. For example, in Australia, Canada and the United Kingdom regular revisions are carried back only for the latest four completed years, in Norway for three years and in the United States for only for the last two years. Revisions for earlier years are stored up to be included in the "benchmark" revisions.

5. The reasons for limiting revisions to only a few years are strictly practical. These countries do not have the resources to carry back revisions for the full period on a regular basis. Although this means that there are breaks in the series and strict comparability is being maintained only for a few recent years, they consider that the breaks are not sufficiently important to merit the very large investment that would be required to maintain strict comparability for longer periods. In the past, several OECD countries did maintain comparability for much longer periods. What has happened is that systems of national accounts have expanded with additional breakdowns and accounts being added, so that the ramifications of revising any individual figure in the accounts have become wider. This is particularly a problem for the growing number of OECD countries that base their accounts on annual supply/use or input-output tables. A change to any single number requires the entire matrix to be rebalanced.

Benchmark revisions

6. *Regular revisions* are undertaken mainly because more complete information becomes available from existing surveys or administrative sources, i.e. the first reason given in paragraph 1. *Benchmark revisions* are mainly due to other reasons listed in that paragraph.

7. Most OECD countries find that benchmark revisions are required about every ten years. Often these are timed to coincide with major censuses – of industry, population or agriculture. Benchmark revisions are also required when countries adopt new versions of the SNA – in 1968 and 1993.

8. Benchmark revisions are carried back over long periods in order to provide users with consistent time series that are needed to estimate key parameters in analytic and forecasting models. This is commonly referred to as "back-casting". Practices vary:

- As a minimum, benchmark revisions are carried back for between twenty and thirty years in most OECD countries.
- A few OECD countries carry these revisions back over forty years, or even, in the case of the United States over the full time period of their official national accounts, i.e. from 1929.
- A different approach is used in the Netherlands which provides consistent time series for periods varying between 10 and 20 years but provides overlap years at the beginning and end of each period. In the overlap year estimates are provided on both the earlier and later bases.

Linking methods.

9. While there are many techniques for back casting they can be roughly classified into four groups:

- Detailed reworking
- Proportion methods
- Interpolation between benchmarks.
- Indicator methods

Countries typically make use of all four methods for a given back-casting exercise.

Detailed reworking

10. Sometimes it may be possible to go back to worksheets for earlier years and re-estimate the accounts using an improved methodology or a different classification. For example, one of the main changes in the 1993 SNA is the reclassification of software and mineral exploration from intermediate consumption into capital formation. If the earlier worksheets identified expenditures on software and mineral exploration it is easy to rework the estimates using the new definitions. It is clear that the greater the detail shown in the worksheets, the more likely it will be that the accounts can be reworked in this way. In general, countries that base their estimation system on an input-output or supply-use table are more likely to have the necessary information.

11. In practice it is often not possible to rework the accounts in this way and even if it is possible it is the task will be too labour-intensive. In the back-casting exercises following the introduction of the 1993 SNA, some OECD countries have tried to rework the accounts for the recent period - say the last five years - but have used simpler methods for earlier periods. Another approach is to confine detailed reworking to the most important parts of the accounts, such as those parts that affect the level and growth rates of GDP, and to use less accurate methods for less critical parts of the accounts.

Proportion methods

12. Simple methods use fixed proportions to allocate revisions to past periods. For example, if a new improved survey shows that retail trade has been underestimated by 10%, then all previous estimates of gross output, value added, etc for this activity would be raised by the same percentage. This procedure is equivalent to applying the former growth rate to the revised level established by the new survey.

13. Clearly this is a rather crude hypothesis and it may be possible to improve it by making assumption about when the previous survey began to underestimate the activity. If the underestimation is thought to have been caused by deterioration of the survey frame, information about how the survey frame has been maintained may suggest when the deterioration began. The latest year's estimates would then be raised by 10% but by amounts that fall to zero in the year when the survey frame was believed to have been correct.

Interpolation between benchmarks.

14. In this approach the accounts are reworked in as much detail as possible for selected ("benchmark") years and estimates for years between benchmarks are obtained by interpolation. Interpolation can be done in various *ad hoc* ways or by a mechanical procedure such as the Chow-Lin method; the unrevised series is used as an indicator of changes between the benchmarks and the Chow-Lin method uses a smoothing procedure to achieve consistency between the interpolated estimates and the benchmarks. In practice mechanical methods usually provide only a starting point and the interpolated data are adjusted by the national accountants and branch experts.

Indicator methods

15. In some cases, new information becomes available for a single point in time and the new data can be carried back to the past using a related indicator. In China for example, a comprehensive survey of the service sector was carried out in 1993. Prior to that date there was very scant information on so-called "non-material" services and the census has not yet been repeated. The Chinese national accountants were therefore required to carry forwards and backwards the 1993 estimates of gross output and value added for a large range of private sector service activities. Indicators related to these various services were used for this purpose. They came mainly from household expenditure statistics and data on employment and on the growth of the urban population.

16. Another example is provided by software. Prior to the 1993 SNA, purchases of software and expenditure on in-house software development was treated as intermediate consumption and most OECD countries did not collect separate information on these outlays. New surveys have since provided the information and the problem was then to make estimates for earlier years. For in-house software development, statistics on the numbers of computer programmers can be used as an indicator; for purchases of software, capital formation in office machinery is a possible indicator.

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