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Revisions Policy for Official Statistics: A Matter of Governance

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REVISIONS POLICY FOR OFFICIAL STATISTICS: A MATTER OF GOVERNANCE

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I. TRODUCTION

1. "Revisions." The word elicits a wide range of images in the world of official statistics, not all of them pleasant. In statistical offices, the image is often of extra work, to develop new series while continuing to prepare and disseminate the to-be-revised series and to carry time series back. To data users, it also means extra work, to update databases and reanalyze time series to see if history has been rewritten. More traumatic than the images of extra work is the image of mistake. Especially in the past but still to some extent today, revisions are associated mainly with mistakes having been uncovered.

2. This paper argues the time has come to bring revisions more fully out in the open and to draw on statistical experience from around the world to work toward identifying a set of good practices. These good practices make up what we can call "revisions policy." Revisions policy should be recognized as an important aspect of good governance in statistics. Good governance in statistics, in turn, is part of public sector transparency and accountability more broadly.

3. At least four developments have put the spotlight on revisions. First, the need for improvements in official statistics has received substantial attention in recent years. For example, the financial crises in the 1990's, in which the lack of relevant data figured prominently in delaying diagnosis, led to a call by the international financial community for the International Monetary Fund (IMF) to establish standards for the dissemination of data to the public. The IMF responded by developing the Special Data Dissemination Standard (SDDS) and the General Data Dissemination System (GDDS).[1] More recently, the **PAR**tnership **I**n **S**tatistics for Development in the **21**st Century (Paris21) consortium of developing countries and donors called for a shared international strategy to seek adequate support for national statistical systems to build to evidence-based policymaking. With determination, cooperation, and goodwill, the need for more and better statistics is being translated into a number of improvements. Some improvements will be additions to sets of statistics, but many will be changes in existing time series. As numerous improvements come onstream, there will be revisions.

4. Second, the international statistical community in the last decade has put major efforts into preparing and promoting methodological manuals for macroeconomic statistics.[2]

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[1] The SDDS and GDDS were established in 1996 and 1997, respectively, to guide countries in the provision of data to the public. For more information, see the IMF's Website at http://dsbb.imf.org/Applications/web/dsbbhome/.

[2] For a summary, see Carol S. Carson and Lucie Laliberté, Manuals on Macroeconomic Statistics: A Stocktaking to Guide Future Work, IMF Working Paper WP/01/183 (available on the IMF Website).

When countries adopt new standards, such as the *1993 System of National Accounts* or the *Classification of the Functions of Government,* it means major revisions.

5. Third, a growing share of the world's population live within regional organizations. These include, for example, the European Union, regional central banks such as the East Caribbean Central Bank, the West Africa Economic and Monetary Union, and the Andean Community. Many of these organizations prepare statistical aggregates from their members' reports. However, the members often have varying revision cycles, with the result that the aggregates, once compiled, are either subject to continuing change or, at the other extreme, are not consistent with the members' data as disseminated.

6. Fourth, member countries typically have obligations to report data to international organizations, and these data provide the basis for decisions on, for example, lending, debt relief, and other assistance. In this setting, it is important to be able to distinguish between bona fide revisions and suspect—perhaps politically motivated—revisions in the data provided. In the IMF lexicon, reporting inaccurate information (as well as failure to report information) is referred to as "misreporting." Although the cases of misreporting have been few, they give rise to difficult situations.[3]

7. It is not surprising, then, that pressure is building at the international level for work on revision practices. For example, The IMF Executive Board, in discussing countries' obligation to provide data to the IMF, encouraged national authorities to articulate their policies on data revisions.[4] And from the perspective of national authorities, participants of the Consultative Seminar on Governance of National Statistical Systems recommended that statistical agencies promptly report revisions and that they provide information on revisions policy, and they urged international organizations to promote the use of good revision practices.[5] The IMF Committee on Balance of Payments Statistics, in making plans for an

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[3] For example, in one case of revisions and misreporting of fiscal data, the IMF Executive Directors "expressed serious concern that the erroneous data had misled IMF staff and the Executive Board about economic performance; prevented the formulation and implementation of timely corrective measures; and resulted in the design of an adjustment program that was partly based on inaccurate information." The country authorities committed to remedial actions. IMF News Brief No. 00/23.

[4] "IMF Executive Board Reviews Data Provision for Surveillance," Public Information Notice No. 02/133 (November 18, 2002).

[5] See Proceedings of the Consultative Seminar on Governance of National Statistical Systems, Singapore, May 28-30, 2002, hosted jointly by the United Nations Statistics Division, the Statistics Department of the IMF, and the Singapore Department of Statistics. The Proceedings are available on the website of the Singapore Department of Statistics (www.singstat@gov.sg).

updating of the fifth edition of the *Balance of Payments Manual,* has put revisions policy on its agenda.[6]

II. Typology and Terminology

8. Revisions, for this paper, are defined broadly as any change in a value of a statistic released to the public by an official national statistical agency.[7] The statistic may be a level, such as the value of a flow (for example, GDP) or of a stock (for example, of financial assets), or a change in level, such as the rate of price increase. As foreshadowed by these examples, this paper will focus on revisions in macroeconomic statistics. Indeed, the set of country experience on which the paper draws is from macroeconomic statistics.

9. Revisions can be classified in at least two ways. One way is by the reason for the revision, and another way is by the timing of the revision. It is especially useful to catalogue these in order to establish a common language.

A. Revisions Classified by the Reason

10. Revisions may take place for at least eight reasons. In reality, some of the distinctions are blurred because two or more kinds of revisions may be made at the same time. Aside from corrections of mistakes, the last item in the list, the reasons tend to break into three groups. The first group is the incorporation of more complete or otherwise better source data, encompassing the first three reasons. The second is routine recalculation, encompassing the next two reasons, and the third is improvements, encompassing the next two reasons.

- Incorporation of source data with more complete or otherwise better reporting.
- Incorporation of source data that more closely match the concepts.
- Replacement with source data of judgment or of values derived largely by statistical techniques.
- Incorporation of updated seasonal factors.
- Updating of the base period.
- Changes in statistical methods.

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[6] See the papers for the Fifteenth Meeting, under Data Quality, especially the paper "Revision Policy and Practice: A First Overview of Country Practices," on the IMF Website.

[7] The term "national statistical agency" will be used to cover national statistical offices, central banks, and ministries in the capacity of making statistical information available to the public.

- Changes in concepts, definitions, and classifications.

- Correction of errors in source data and computations.

11. The first reason, incorporation of source data with more complete reporting, causes revisions across a wide spectrum of macroeconomic statistics. At one end of the spectrum, a first report on credit aggregates may be based on the largest financial institutions and then the aggregate is revised when reports from all institutions, including the slower ones that have less sophisticated reporting or are from outside the major cities, become available. At the other end of the spectrum, data from monthly samples may be replaced in national accounts components with data from more comprehensive annual samples. For example, in the quarterly national accounts of several countries, monthly data from a retail sales survey are used until they can be replaced with data from more comprehensive sources. Two other reasons for revisions are related. Updating of weights, as for price indexes, brings in information from more recent surveys. Incorporation of audited results, as for budgetary figures and data from financial reports, to replace early results in effect brings in "better" data.

12. The second reason, the incorporation of source data that more closely match the concept, is most likely to occur in datasets that piece together many data sources in a mosaic that represents a comprehensive picture of some aspect of the economy. The national accounts and balance of payments are prime examples of such datasets. For example, if production is to be measured, source data that represent sales (plus some adjustments) may provide a first estimate and then the estimate is subject to revision as data more closely matching production become available.

13. In some situations no current data may be available, and a first estimate is based on judgment or statistical techniques. A revision may then occur when data become available. Such situations may arise for quarterly national accounts. The United States uses judgmental extrapolation for the first quarterly estimate for several components, including domestic services and improvements on owner-occupied housing. Subsequently, data become available that can be incorporated.

14. These first three reasons often appear together, for example, in national accounts and balance of payments. In monetary and government finance statistics, the reasons often boil down to completing institutional coverage and incorporating the outcomes of audited reports.

15. Incorporation of updated seasonal factors relates closely to the incorporation of additional source data, and some lists of reasons for revisions do not list the two separately. Seasonal factors, such as those that are derived from a moving average of experience or from the most recent year (concurrent seasonal factors), can change as the new experience comes into, and older experience drops out of, the calculations. Some countries rarely revise the consumer price index to bring in new or additional price observations, but do revise once a year to incorporate updated seasonal factors. For example, the U.S. Bureau of Labor Statistics, with the release of the January index, each year recalculates the seasonal

adjustment factors to reflect price movements in the just-completed year. This routine annual recalculation may result in revisions to seasonally adjusted indexes for the previous five years.

16. Updating of the base year of an index—that is, the year set equal to 100—is also often a routine reason for revision. This may be carried out as a separate step, but usually it is done when new data underlying the weights for the index are introduced.

17. Incorporation of changes in statistical methods is sometimes not listed separately because such changes often go hand in hand with changes in source data. However, they can also occur independently. For example, revision studies may reveal that a particular method can be improved or replaced by another to achieve greater accuracy or timeliness. In the last few years, this source of revision has become more prominent as countries moved from fixed-weighted volume and price measures to chain-weighted measures.

18. Changes in concept, definitions, and classifications, often stimulated by adoption of new international guidelines, are yet another source of revision. For example, when a country moved from following the fourth to the fifth edition of the *Balance of Payments Manual*, the definition of the current account changed to exclude capital transfers and acquisitions/disposals of nonproduced assets. The *1993 SNA* embodied a broader concept of investment, so as countries move toward that standard and add software, for example, as investment, they introduce a new concept. Major efforts have been devoted to reaching internationally agreed classifications in recent years. The Classification of the Functions of Government (COFOG) and the Classification of Individual Consumption by Purpose (COICOP) are cases in point. The introduction of new classifications is often done on the occasion of the introduction of new concepts and definitions, but sometimes it is done on its own.

19. In addition, changes in presentation of statistics should be mentioned. They do not, strictly speaking, fit the definition of revision as a change in a value of a statistic. However, they often take place at the same time as revisions, especially revisions caused by changes in concept, definitions, and classifications. Changes in presentation are also often implemented to respond to the analytical needs of users. For example, Appendix II describes how Australia began reporting financial derivative asset and liability positions on a gross basis rather than on a net basis.

20. Finally, revisions occur as errors are corrected. Errors may occur in source data or in processing. For example, reporting institutions may discover after submitting the data that some components are missing or outdated seasonal adjustments may have been inadvertently applied.

B. Revisions Classified by Timing

21. As to timing, some revisions are made in the weeks or months shortly after a first release. These are “current revisions” because they affect the current weekly, monthly, or quarterly data. “Annual revisions” are made after data for all the months or quarters of a year

become available. Audits are usually done for a calendar or fiscal year's data, although the results may not be available for some time after the close of the year. Both current and annual revisions usually stem from the first four reasons: incorporating source data with more complete reporting, incorporating source data that more closely match concepts, replacing judgment and statistical techniques, and incorporating updated seasonal factors. Annual revisions often affect several years of data—perhaps three or four years, so an annual estimate may be subject to revision more than once. For example, in the U.S. national accounts, there are three such revisions, as important additional annual source data arrive in each of three years.

22. Less frequent revisions, often four or more years apart, may be called "comprehensive," "major," "historical," or "benchmark" revisions. Typically they are occasions for major changes in statistical methods and changes in concepts, definitions, and classifications. Often these revisions are carried back, or backcast, for a number of years. Revisions that correct error, of course, have no predictable timing.

III. Context of Revisions

23. This section will describe the context in which revisions occur and the parameters that must be taken into account by policies designed to manage the revisions process. The context of revisions can be analyzed from three main points of view: user needs, resource issues, and maintenance of credibility.

A. User Needs

24. As documented in the data modules of the IMF Reports on the Observance of Standards and Codes (ROSCs), surveys and meetings with users from a wide range of countries confirm their concern about revisions and revisions practices.[8] User needs with respect to revisions fall into the following four categories:

- The *timeliness* of first release of data and timing of subsequent revisions
- The *accuracy* of first release of data and subsequent revisions
- The *consistency* of data over time
- The *documentation* for the revisions that is provided to users

1. Timeliness

25. Some users—such as policymakers, investors, international organizations, and the media—put strong emphasis on the timeliness of statistics. A key aspect of timeliness is the early release of economic data. For a central bank to conduct monetary policy effectively, it will need to analyze data on inflation and growth of monetary aggregates that are as up-to-

[8] See the link on ROSC reports in http://dsbb.imf.org.

date as possible. For investors and financial markets to make informed decisions, they also need timely data. For the IMF to monitor adequately economic developments and Fund-supported programs in member countries, it requires the latest data at the earliest possible date.[9]

26. Another aspect of timeliness that concerns users is that the timing of first release of data and subsequent revisions is predictable and relatively stable from year to year. In addition, the timing of the release may need to be coordinated with preparing important official policy documents, such as government budgets.

2. Accuracy

27. While policymakers and financial markets place a high premium on timely data, they also need a degree of accuracy. Inaccurate data may cause them to make wrong decisions. Although they want timely data on which to base their decisions, they do not want to take a decision based on data that are likely to change substantially in the next month or next quarter. Among users, researchers and the academic community place perhaps the highest priority on accuracy, as timely data are less important to them than an accurate and comprehensive time series of data.

28. The importance placed by users on accuracy clearly requires that they be able to judge the accuracy of preliminary data and subsequently revised data. To make informed judgments, revised data must be clearly identified and documentation provided. The documentation should include information on the sources and methods used to prepare data, on changes to be incorporated in upcoming major revisions, and, post-revision, on the sources of the revision (see section 4 below). Some indication from statistical agencies of how accurate preliminary or estimated data are would also be useful.[10]

3. Consistency

29. Many users, particularly those engaged in research and forecasting, require consistency of data over time. While they realize that revisions will yield more accurate data,

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[9] There are limits, of course, to how far statistical agencies can go in providing frequent and timely data because of the trade-off with accuracy and also because of resource constraints and the demands of good statistical practice. It is said that Alan Greenspan once remarked that he would like to have "weekly GDP," which is indicative of the extremes that could be considered if timeliness were the only user need taken into account.

[10] If researchers are trying to explain how policymakers make their decisions, they may want to use the initial estimates on which decisions are based and not the final data. See David E. Runkle, "Revisionist History: How Data Revisions Distort Economic Policy Research," *Federal Reserve Bank of Minneapolis Quarterly Review*, Fall 1998 (Vol. 22, No. 4).

they are concerned that revisions that are frequent or large may disrupt their databases and cause inconsistencies unless the revisions are backcast over a sufficient number of years. As well, users who work with several datasets will be concerned that revisions be carried out in a coordinated way to avoid lengthy periods when one dataset is revised and others are still on the old basis.

4. Documentation

30. To lessen the trauma caused by the revisions, users would want clear documentation. Basic documentation should include identifying in statistical publications data that are preliminary (or provisional or estimated) and revised data, explaining the sources of revisions, and explaining breaks in series when consistent series cannot be constructed. Documentation is particularly important when changes in concepts and definitions are involved because such changes can seriously affect the interpretation of various statistical applications (for example, forecasts) and empirical tests of the validity of economic theory.[11] Meetings and consultations with users arranged by the statistical agency can also be helpful in explaining the reasons for and content of revisions, particularly in advance of the revisions so that users can prepare better to deal with them.

B. Resource Issues

31. Resources affect countries' revisions policies in several ways. On the one hand, there are specific questions of cost effectiveness (that is, is the increased accuracy gained from a revision worth the cost?). On the other hand, there are questions about the basic design of the statistical compilation system itself, which has fundamental implications for the costs of revisions.

32. As described in section II, revisions are driven primarily by the arrival of source data. Typically a core set of source data are available for the first estimates that are released to satisfy the need for timeliness. Then, as more detailed and comprehensive source data arrive, the first estimates are revised to improve the accuracy of the statistics. In designing the statistical compilation system and defining the surveys and administrative data to be used as source data, it is important to bear in mind the cost implications of alternative designs and definitions.

33. Statistical agencies must operate within limited budgets and make efforts to ensure the cost effectiveness of their programs, including revisions. Again it is a matter of balancing—balancing not only timeliness against the accuracy needs of users, but also balancing both timeliness and accuracy needs against the marginal costs of achieving improvements in both areas. Costs are incurred not only by the statistical agencies, but also

[11] See Robert Eisner, "Divergences of Measurement and Theory and Some Implications for Economic Policy," *American Economic Review*, March 1989 (Vol. 79, No. 1), pp. 1–13.

by the respondents who must take the time and effort to complete the questionnaires and data submissions necessary to comply with data release and revisions policies. A kind of "cost benefit analysis" must be done in order to take realistic and sustainable decisions with respect to the frequency of data releases and revisions. It should be conducted in a way that balances needs and costs across different types of data users and different data sets. Unfortunately, no mathematical formula exists to conduct this type of analysis. It must, in effect, be must be accomplished in a less precise way through the process of consultation and coordination among statistical agencies and users, as well as with the political authorities who control the agencies' funding.

34. In many countries, particularly developing countries, statistical agencies are often seriously under-resourced both in absolute terms and relative to other government agencies. In these circumstances, it will be important that statistical agencies undertake efforts to raise the consciousness of the political authorities to the serious consequences of neglecting to build adequate statistical capacity. International organizations have an important role to play in this arena. This was evident, for example, at an international seminar on statistical governance issues where representatives from developing countries noted how they valued the support that they receive from international organizations in raising increased budgetary resources.[12] With respect to revisions, both statistical agencies and international organizations must impress on the political authorities of countries the critical importance of adequate resources to allow for the timely release and revision of official statistics.

C. Maintenance of Credibility

35. Prime Minister Tony Blair, in his introduction to *Building Trust in Statistics—The White Paper on Statistics*, stated "I believe that having access to official statistics which we can all trust is essential in any healthy society. Statistics encourage debate, inform decision making both inside and outside government, and allow people to judge whether the Government is delivering on its promises. For official statistics to play that key role effectively in democracy, we need to have confidence in the figures themselves."[13] Confidence in the figures effectively must be built on confidence in the statistical agency disseminating them.

36. Fundamental to achieving trust in, or credibility of, statistical agencies is integrity. Integrity is a central element in the IMF's Data Quality Assessment Framework and is also

[12] Proceedings of the Consultative Seminar on Governance of National Statistical Systems, Singapore, May 28-30, 2002.

[13] The paper Building Trust in Statistics—The White Paper on Statistics, is available on the website of the U.K. Office of National Statistics (www.statistics.gov.uk).

prominent in the U.N. Fundamental Principles of Official Statistics.[14] Providing assurances of integrity involves, at the broadest level, enacting effective statistical legislation and ensuring the professional autonomy of statistical agencies. But establishing a sound revisions policy is also a key element necessary to gain the trust of users.

37. It is not unusual for a distrust of government (or the political party in power) to be translated into distrust of official statistics, or at least a healthy degree of skepticism. Revisions can be particularly sensitive if statistical agencies handle them in an unprofessional manner. At the extreme, users may even suspect the government is intentionally misreporting for its own political or financial motives. For example, investors might suspect the government is intentionally delaying or misreporting data on international reserves to prevent capital flight. Or the media may suspect the government is manipulating statistics to avoid criticism of its policy record. Or an international organization may worry that a government is misreporting to comply with a policy target.

38. What are the needs of users with respect to revisions and the credibility of official statistics? With respect to the release of first estimates, users need to be able to make informed judgments about the quality of these estimates. How accurate are they? What is the likelihood of further revision, and by how much and in what direction? When will the data be "final"? For the revisions themselves, users need to be informed about the causes of the revisions, as well as have access to complete documentation on methodology and procedures. Users will also be reassured if they see that revisions take place within the framework of an overall policy and according to a predetermined schedule. If the policy, procedures, and schedule are published, it will be evident that revisions are not ad hoc and for political interests, and that adequate safeguards exist to prevent abuses in this area. Finally, when mistakes are discovered, it is critical that the statistical agency report them to the public as soon as possible and provide satisfactory explanations to reassure users and enable them to distinguish honest mistakes from cases of "misreporting."

IV. Good Practices for Revision Policies

39. This paper has argued that a sound revisions policy contributes inter alia to good governance in official statistics. Many countries have not yet set out a well-articulated revisions policy. In recent years, however, revisions policy is receiving more emphasis. For example, the *Quarterly National Accounts Manual*, Chapter XI)[15] provides a discussion of revisions policy. The Ecofin Council of the European Union, in February 2003, included a section on revisions in its "Code of Best Practices on the Compilation and Reporting of Data

[14] Six of the ten U.N. Fundamental Principles relate to various aspects of integrity of official statistics.

[15] Adriaan Bloem, Robert Dippelsman, and Nils Maehle, *Quarterly National Accounts Manual*, International Monetary Fund, Washington, D.C., 2001.

in the Context of the Excessive Deficit Procedure." As well, the IMF's Data Quality Assessment Framework includes a number of good revision practices.

40. This paper builds on recent efforts to define good revisions policy. Its purpose is to work toward outlining a more comprehensive and internationally accepted set of good practices that would together constitute a sound revisions policy generally applicable. The good practices described below were arrived at by combining general considerations identified in the discussion of user needs, resource issues, and maintenance of credibility in section III, with specific practices drawn from a selection of examples of practices in place in various countries. The country examples—from national accounts, prices, government finance statistics, monetary statistics, and balance of payments statistics—are included in three appendices. A comprehensive description of revisions policy in the United States for GDP is in Appendix I. Another comprehensive single-sector example appears in Appendix II, which outlines Australia's revisions policy for balance of payments statistics. Using the database of published ROSC reports, Appendix III presents short descriptions of certain aspects of revisions policies for a regionally diverse sample of countries.

41. Eight main revisions practices are identified in this paper. They are consistent with the general principles of good governance in statistics, such as they appear in the Fundamental Principles of Official Statistics and in the *Handbook on the Operation and Organization of a Statistical Agency*. In fact, the revision practices identified can be seen as making explicit the application of these principles about, for example, integrity, responsiveness to users' needs, and professionalism in the context of revisions.

1. Consultations with users elicit views about revisions practices

42. Preliminary to elaborating a country's revisions policy, it is important to consult the main users of official statistics to identify needs and priorities specific to the individual countries. Their views could be sought, for example, about their particular needs for timeliness of data, problems they experience because of revisions, and their priorities about balancing timeliness with accuracy and consistency.

2. A clear, short summary statement of when to expect revisions and why is readily accessible to users

43. Most revisions fall under a "revisions cycle." Cycles typically incorporate current (for example, quarterly) and annual revisions as defined in section II and less frequent comprehensive or benchmark revisions that usually relate more to the two "improvements" reasons listed in section II. A noteworthy example of a clear, short summary of revisions policy is the description for national accounts in the United States in Box 1 of Appendix I.

3. The current revision cycle is relatively stable from year to year

44. Current and annual revisions are done broadly to incorporate more complete or otherwise better source data. The following practices relate to the timing of current and annual revisions:

3.1 The revisions are timed to incorporate new source data

3.2 The revision schedule takes into account the timing for preparing important official economic policy documents

3.3 The revision schedule takes into account the timing of revisions in other datasets

45. Stability of the revision cycle from year to year is at the heart of good revisions policy. It is one of the few practices followed by all countries covered in Appendix III. Users place great importance on a revision schedule that is regular. Fortunately, for countries that decide to establish a revisions policy, it is not difficult to ensure that its timing is stable over time. Indeed, it is a logical outcome and one that promotes efficient implementation. The most common basis for stability is the timing of arrival of source data, which then triggers their incorporation into revised data.[16] Occasionally, a balance must be struck between maintaining the stability of the cycle and making unpredictable but important revisions outside the cycle. Coordinating timing with important official economic policy events can also be useful. For example, Italy times the release of national accounts to coincide with the annual presentations to their parliaments on the economic situation. It is also important to coordinate with other macroeconomic sectors to ensure consistency (see example of Australia in Appendix II coordinating revisions of balance of payments statistics with national accounts).

4. Major conceptual and methodological revisions are usually introduced every four to six years, balancing need for change and users' concerns

46. Major conceptual and methodological revisions relate mainly to the two "improvements" reasons for revisions outlined in section II—to incorporate new statistical methods and new concepts, definitions, and classifications—all super-imposed on changes in the structure of the economy. These revisions are typically more far-reaching and complex than current revisions, and can be disruptive and problematic for users if they occur too often

[16] For government finance statistics and monetary statistics, a common basis for revisions is the official audit of the data, which are conducted more on the basis of accounting principles than statistical methodology. In fact, it is not uncommon to find that the only revisions of government finance and monetary statistics occur as a result of the official audits (see Italy [34] example for government finance statistics in Appendix III). Data are usually considered "final" after the audits, which tends to make further revisions unlikely.

or take place in a confusing or unpredictable manner. A reasonable guideline for regular timing would be every four to six years. Timing such as this balances the need to avoid unnecessary disruptions to time series with the need to maintain the quality of statistics in line with international best practices and the changing institutions and structure of the economy. For example, see the description in Appendix I of the U.S. five-year cycle for major conceptual and methodological revisions for GDP and the descriptions in Appendix III of the four-or-more-year cycles in Italy [31], Norway [64], and Turkey [100] for national accounts revisions.

47. Although individual countries do not control the timing of major changes in international statistical methodologies (for example, the appearance of *1993 SNA* and the *BPM5*), a four-to-six-year cycle can generally accommodate these changes without undue delays and disruptions. Incidentally, it is also possible and can be helpful to users to coordinate the timing of methodological improvements with the current cycle of revisions timed for the arrival of better source data (see the U.S. example in Appendix I). Countries do have control, however, over the timing of methodological and classification changes that they undertake to reflect institutional and structural changes in their own economies. These kinds of changes can be accumulated, studied, and prepared for during the four-to-six-year intervals before they are finally published. The example of the United States in Appendix I is illustrative; the comprehensive revision of GDP in 1999 introduced improvements in definitions and classifications. The improvements included the recognition of business and government expenditures for software as fixed investment, the treatment of government employee retirement plans in the same way as private pension plans, and others reflecting institutional and structural changes in the economy.

48. Mongolia recently provided an example of a revision to reflect a change in methodology to come into line with international standards and to make corrections for previous years. The Chairman of the National Statistical Office and the Minister of Finance and Economy, in a Joint Resolution in November 2002, explained to the public in a clear and transparent manner a revision in GDP methodology. The previous methodology had not accounted for exceptional animal losses and resulted in significant misstatements of GDP, particularly in years of severe weather. An accompanying technical paper explained the reasons for changing the methodology and how the revision affected estimates of GDP in previous years.

5. Revisions are carried back several years to give consistent time series

49. To maintain the serviceability of data following major revisions, data should be revised back as far as is reasonable based on a balancing of user needs, costs, and availability of source data. The revised time series should be released simultaneously with the revised current data or soon thereafter, preferably in easily accessible electronic format. The revised series should be of sufficient detail and not so aggregated that users are not able to detect the sources of the changes. Clearly, some revisions are more difficult than others to revise backwards. Among these are data from surveys that have changed, data affected by legal constraints, and data constrained by accounting principles (for example, government finance

statistics). Lack of resources also constrains the extent of backward revisions, especially for poor countries. Various second-best approaches are possible, such as the U.S. practice described in Appendix I where GDP series are revised back to the last benchmark (usually five years) and further back for selected series that are particularly important. Estonia revised GDP back five years following a major revision, providing only annual data but offering to provide quarterly data on request.

6. Documentation on revisions is readily available to users

6.1 Preliminary (or provisional or estimated) data and revised data are identified as such

50. While this practice may seem obvious, it is not uncommon to find in many countries that preliminary and revised data are not clearly identified. This is especially likely in countries where revisions are not made according to a consistent or clearly stated revisions policy. It also occurs more often for government finance statistics and monetary statistics, where statistical principles may not be as much at the forefront as in national statistical offices. Serious confusion and misunderstandings by users could easily arise from neglect to identify changes in data. Examples of clearly identified status of data are provide in Appendix III for national accounts and balance of payments statistics (for example, Chile), for monetary statistics (for example, Estonia), and for government finance statistics (for example, South Africa).

6.2 Advance notice is given of major changes in concepts, definitions, and classification and in statistical methods

51. Users should be alerted in advance of major conceptual and methodological revisions to help them prepare for and understand better the reasons for and nature of the changes. The account in Appendix II of Australia's efforts to prepare users for revised balance of payments statistics according to *BPM5* is noteworthy. The statistical agency provided a description of the new standard and its benefits in advance, including illustrations of sample draft data tables to begin to acquaint users with the changes. Consultations with key users dealt with the implementation of the new standard, and a number of changes were made in the implementation strategy and schedule as a result. Various reports and discussion papers published in advance of the revision analyzed and described the effects on Australia's statistics. Other examples are the media conference called by Estonia to announce major upcoming revision in GDP (see Appendix III) and the preparations by the United States described in Appendix I to alert users to the next benchmark GDP revision.

6.3 The sources of revision are explained when the revised series are released

6.4 Breaks in series are documented when consistent series cannot be constructed

52. Complete and transparent documentation of revisions allows users to understand the sources of revisions and, if needed, adjust their analysis of the data. Perhaps even more importantly, complete documentation serves to promote trust in the credibility and integrity

of the data and the institutions responsible for compilation and dissemination. Key parts of the documentation are about the sources of the revisions, including the main flows of source data from the preliminary estimates to the revised data. It is also important that breaks in the series be clearly identified when consistent time series cannot be constructed. Documentation can be available to users in hard copy publications, websites, press releases, and dedicated seminars (for example, see Italy [32] in Appendix III). Box 2 in Appendix I provides an example of documentation for sources of revisions for the United States GDP, and Box 5 in Appendix II an example of explanation of revisions for Australia balance of payments statistics.

7. Users are reminded of the size of the likely revisions based on past history

53. It is particularly important for users who make decisions on the basis of preliminary estimates, such as policymakers and investors, to be able to make an informed judgment about the reliability and accuracy of the preliminary, provisional, or estimated data. How much confidence should they have in the first estimates? Accordingly, it is good practice for statistical agencies to conduct periodic analyses of revisions (or "revision studies") and to make them available to users. Today's IT environment makes such studies less demanding than in the past. The following two good practices for revision studies have been identified:

7.1 Periodic analyses of revisions investigate the sources of revision from earlier estimates and statistical measures of the revisions (for example, dispersion and bias)

7.2 The analyses are published for major aggregates to facilitate assessment of the reliability of the preliminary estimates

54. Measures of the direction and dispersion of revisions are the main topics of most revision studies. With respect to measures of the direction of revisions, if a study shows a systematic bias in the revisions, users can adjust appropriately their interpretation of the preliminary estimates. Alternatively, the discovery of bias by a study may lead to changes in procedures, and these can be announced with the study results. See the description in Appendix II of Australia's discovery of negative bias in the balance of payments current account first estimates, and their changes in procedures in collecting source data to correct this bias. Revision studies can also be used to fine tune the timing revisions within the cycle.

55. Measures of dispersion of the revisions provide users with an indication of the accuracy of the preliminary estimates and enable them to assess the likely size of future revisions. Box 3 in Appendix I provides an informative explanation and table provided to users on the historic size of revisions of GDP in the United States. This statistical analysis provided a range within which future revisions of GDP could be expected (that is, "the fourth-quarter change in real GDP, now estimated at 0.7 percent at an annual rate, is not likely to be revised below 0.1 percent or above 1.6 percent in the next two releases").

56. It is important to report to users not only the statistical analysis carried out in the revision studies, but also the basic data flows from the first estimates through all the

revisions. The main conclusions of the studies should be clearly stated. For example, a recent U.S. revision study concluded that GDP revisions have no "momentum." They are not biased in a way that could predict future revisions, and they are explained largely by new information/definitions (see Appendix I). Providing the basic data to users allows them to conduct their own studies of revisions if they wish. For example, Runkle (1998), in a study conducted four years earlier than the study mentioned above, found that some bias did exist in revisions of GDP in the United States.

8. When a mistake in reporting or processing is made, the revision is made in a transparent and timely manner

57. As the saying goes, "to err is human," and contrary to some jokes, statisticians are human. Many different types of mistakes occur in official statistics, from simple mathematical and recording errors to misclassifications and mistakes in coverage. The mistakes may be by the statistical agency, or by the reporters of source data. It is critical for the integrity of a country's statistical system that any errors are not only reported to users as soon as possible, but also explained in a way that gives assurance that the mistakes were not politically motivated. Explanations for mistakes are much easier when users are already well informed by complete metadata and related documentation on the compilation procedures and sources and flows of data used by the statistical agency. In such a transparent environment, it is just as likely that users will detect errors as the statistical agency, or will at least quickly understand the source of the error.

58. An example of reporting errors is provided in Box 5 of Appendix II. The Australian statisticians explain several errors in balance of payments statistics that they identified through improved data collection (expanded individual security reporting leading to detection of mistakes in classification) and analysis of data.

59. An example that received wider publicity was the recent announcement by the Philippine government that its balance of payments current account surplus had been significantly overstated for the past several years owing to an understatement of imports. An interagency task force, working with the IMF, identified these errors. Both the government and the IMF issued statements that the errors originated from the complex task of collecting and validating import data from a large number of companies following exchange liberalization that eliminated banking data as a source for imports. They also explained that the overall balance of payments, and both gross and net international reserves, were not affected, in order to provide a broader perspective of the economic significance of the correction. The clear and transparent explanations avoided an erosion in confidence and trust in the government that might have occurred if the errors had come to light in a less orderly and effective manner.

60. Appendix III mentions only one example that might be a practice regarding revisions resulting from mistakes. Norway [84], in a note to a press release, explained that a revision was caused by the identification of a missing major reporter. Closely related, however, are the practices noted for Estonia [27] and Ukraine [117] of conducting internal analyses of

errors made by reporting institutions. Identifying and correcting errors is the first important step, followed up by a transparent and timely report about the errors to users.

V. NEXT STEPS

61. The pressures are building from several directions, as noted in the introduction, to elaborate an internationally accepted set of good practices for revisions and to recognize the importance of a revisions policy. This paper tries to push the process further by suggesting a clear typology and terminology to facilitate discussion, by laying out the landscape of needs and constraints to be addressed, and by proposing a set of good practices for discussion.

62. The international statistical community is invited to discuss the proposed practices, particularly to refine them for macroeconomic statistics and extend them to other statistics, with a view to agreeing on a set of good practices for revisions of official statistics. Such a set could serve as a useful guide for countries designing revisions policies to fit their own particular circumstances. These practices could be adapted for presentation in international methodological manuals and in quality frameworks, such as the IMF's Data Quality Assessment Framework.

63. Meanwhile, however, both international organizations and individual country authorities could take intermediate steps. As noted in section III, the resource issue is a key factor in elaborating a revisions policy, and the resource issue is closely related to the profile or stature of official statistics in countries. International organizations can play an important advocacy role by impressing on the country authorities that good governance in official statistics is a key part of ensuring public sector transparency and accountability and accordingly that adequate budgetary resources should be provided.

64. Statistical agencies may also begin to take some actions in anticipation of an internationally agreed set of good practices for revisions policy. Conducting consultations and meetings with users and surveying their needs and priorities must be the basis for any well considered revisions policy. Communication with users will provide key information concerning the difficult task of balancing timeliness, on the one hand, and accuracy and consistency on the other hand, necessary to set a satisfactory schedule for the release of preliminary and revised data. Statistical agencies may also begin to implement some of the less debatable and complicated of the proposed best practices, such as the relatively simple and straightforward practice of identifying preliminary and revised data in statistical publications.

65. A concluding thought—perhaps once we begin to know revisions better, they will not seem so traumatic after all.

The Policy and Practice of Revising GDP Estimates in the United States

The policy and practice of revising GDP estimates of the Bureau of Economic Analysis (BEA)[17] has three noteworthy features:

- A clear, short summary statement of when to expect revisions and why is provided to users.
- Major conceptual and methodological revisions are introduced only every five years or so.
  - The data are revised back several years to give consistent time series.
  - The revisions are explained in advance.
- The users are reminded of the size of the likely revisions based on past history.

(i) *A clear, short summary statement of when to expect revisions and why is provided to users*, normally in the BEA news releases and on the BEA's website (see Box 1, which is a typical summary statement of the revision cycle of the GDP estimates provided by BEA). The revisions typically involve a cycle of five years that includes three estimates for each quarter, annual revisions of the estimates for the three most recent years, and quinquennial benchmark revisions. The cycle reflects the "time-dependent nature of the quantity and quality of the source data."[18] *The information about the sources of the revision is widely disseminated*, for example, through news releases, publication in one of the current quarterly releases, publication in the *Survey of Current Business*, and posting on the BEA's website.

The revisions in the estimates incorporate the following main types of improvements (see Box 2, which reproduces extracts from a BEA news release concerning the sources of revision in the GDP estimate for the first quarter 2002):[19] (i) in source data—as new data become available, including new benchmark input-output accounts, judgmental estimates/source data of earlier vintage are replaced; (ii) in methodologies, such as changes in the measures of real growth and inflation,[20] and changes in definitions and classifications

[17] The BEA, an agency of the Department of Commerce, collects data from other (mainly Federal) statistical agencies and firms, conducts research and analysis, develops and implements estimation methodologies, and disseminates the statistics.

[18] McCulla and Moylan (2003), Moulton (2000), and BEA (1998).

[19] Fixler and Grimm (2002).

[20] Until late in 1991, real growth was measured using the GNP adjusted for inflation, and inflation was measured using the implicit GNP price deflator. From the fourth quarter of 1991 to late 1995, growth was measured using the GDP adjusted for inflation, and inflation

(continued)

that better reflect the current features of the economy, such as the recognition of computer software as investment; and (iii) in presentation of GDP and other tables to make them more informative. The estimates may also be revised to update seasonal adjustment factors, and correct errors in source data or computations.[21]

Box 1: The BEA Summary Statement of the Revision Cycle

Quarterly estimates of GDP are released on the following schedule: "Advance" estimates, based on source data that are incomplete or subject to further revision by the source agency, are released near the end of the first month after the end of the quarter; as more detailed and more comprehensive data become available, "preliminary" and "final" estimates are released near the end of the second and third months, respectively.

Annual revisions are usually carried out each summer and cover the quarters of the most recent calendar year and of the 2 preceding years. Comprehensive (or benchmark) revisions are carried out at about 5-year intervals and incorporate definitional and classificational changes that update the accounts to portray more accurately the evolving U.S. economy and statistical changes that update the accounts to reflect the introduction of new and improved methodologies and the incorporation of newly available and revised source data.

Source: BEA News Release, January 30, 2003
(http://www.bea.doc.gov/bea/newsrel/gdpnewsrelease.htm)

Quarterly revisions: The quarterly 'advance' estimates of GDP are extrapolations that are derived from a combination of preliminary results from surveys, such as the surveys of retail sales and manufacturers' shipments, and extrapolations for such components as international trade, private inventories, and a large share of consumer spending on domestic services. The 'advance' GDP estimates are released near the end of the first month following the reference quarter, and subsequently revised. At the time of preparing the 'preliminary' estimates, among other improvements, the extrapolations used in the advance estimates are replaced by survey data on private inventories and customs data on international trade in goods—two volatile GDP components. The 'preliminary' estimates are released at the end of the second month following the reference quarter. The 'final' estimates are released at the end of the third month. In addition, the quarterly GDP estimates are revised three times in the course of as many years (except in the years when benchmark revisions are done) as the first, second, and third annual revision estimates.

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was measured using the implicit GDP price deflator, assuming that the market basket of goods and services was constant over time. From the fourth quarter 1995, chain-weighted implicit price deflators are used.

[21] Since seasonal adjustment factors typically depend on future data, the seasonal adjustments are revised when these data become available.

Box 2: Sources of Revision

Quarterly revision
The GDP estimates (GDP: First Quarter 2002 FINAL) released today are based on more complete source data than were available for the preliminary estimates issued last month. In the preliminary estimates, the increase in real GDP was 5.6 percent. The final estimate of the first-quarter increase in real GDP is 0.5 percentage point, or $12.3 billion, higher than the preliminary estimate issued last month. The upward revision to the percentage change in real GDP reflected a downward revision to imports of goods and services and an upward revision to equipment and software that were partly offset by a downward revision to exports of goods and services.

	Advance	Preliminary	Final
	Percent change from preceding quarter)		
Real GDP	5.8	5.6	6.1
Current-dollar GDP	6.7	6.6	7.5

Annual revision
The annual revision of the national income and product accounts, covering the first quarter of 1999 through the first quarter of 2002, will be released along with the advance estimate of GDP for the second quarter of 2002 on July 31. Features of this revision include the incorporation of a new price index for brokerage services and the adoption of a new revision schedule for wages and salaries that permits the incorporation of more comprehensive quarterly source data on a more timely basis. An article describing the revision will appear in the August 2002 issue of the *Survey of Current Business*.

Source: BEA News Release, June 27, 2002 (http://www.bea.doc.gov/bea/newsrel/gdp102f.htm)

Annual revisions: The first annual GDP estimates are derived as the sum of the quarterly estimates of the reference year, and revised each summer (in July). The estimates of the most recent calendar year and the two preceding years are subsequently revised. The revisions are timed to include major annual source data that become available at this time, and new quarterly data. For example, the preliminary Internal Revenue Service (IRS) tabulations of data from corporate tax returns that are used to compile estimates of corporate profits become available about two years after the reference year, and the final tabulations are available with a three-year lag.[22]

BEA also makes improvements when it does the routine work of bringing in better source data. For example, the latest annual revision of the estimates (1999–2001) included such

[22] The tax-based data cover all incorporated businesses and all industries, while financial-accounting measures are less comprehensive. However, since the latter are available on a more timely, quarterly basis they are used to extrapolate the tax-return-based estimates to current periods (Seskin and McCulla (2002)).

improvements as (i) a new methodology and revision schedule for the quarterly estimates of wages and salaries and related income-side components; (ii) new price indices to improve the real estimates of personal consumption expenditures, foreign transactions, and Federal Government spending; and (iii) the compilation of personal consumption expenditures on a commodity basis, etc.[23] The previous annual revision of the estimates (1998–2000) incorporated, among other things, the North American Industrial Classification System (NAICS), which effected the detailed estimates of private inventories by industry.[24]

(ii) *Major conceptual and methodological revisions are introduced only every five years or so*. Typically, such revisions are introduced in the comprehensive revisions of GDP estimates. For example, the 1999 comprehensive revision—the eleventh such revision—included improvements in definitions and classifications,[25] such as, recognition of business and government expenditures for software as fixed investment; treatment of government employee retirement plans in the same way as private pension plans; redefinition of dividend payments by regulated investment companies to exclude distributions that reflect capital gains income, etc.[26]

All previous period estimates are subject to revision in comprehensive revisions starting from the last benchmark input-output table. Selected series are revised for earlier periods to give consistent long-term time series. Currently, the revised annual NIPA estimates are available from 1929. The quarterly current dollar series start from 1946, and the series on quantity and price measures from 1947. The monthly series start from 1959.

Improvements in the comprehensive revisions are publicized in advance.[27] For example, the BEA has stated that in 2003 it intends to start the twelfth benchmark revision of the GDP estimates and other NIPA's. Among other things, the revision will incorporate the

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[23] Seskin and McCulla (2002).

[24] Moulton, Seskin and Sullivan (2001).

[25] Definitional changes accounted for an upward revision in the GDP of around $74.5 billion (McCulla and Moylan (2003)).

[26] Moulton, Parker and Seskin (1999). The revision also incorporated the 1992 benchmark I-O accounts, and improvements in presentation, such as, redesigned National Income and Product Accounts (NIPA) tables reflecting definitional and classification changes, new data series on computers and their contribution to GDP growth, and chain-type quantity and price indexes with reference year updated from 1992 to 1996 (Moulton and Sullivan (1999)).

[27] Adequate advance information is provided, as well, for other revisions (for example, for annual revisions see Box 3).

1997 benchmark I-O accounts,[28] the reclassification of industry estimates using NAICS, new producer price indexes for services for deflation purposes, and several presentational improvements, including updating the reference year for price and quantity measures to 2000.[29]

(iii) The *BEA reminds users of the size of the likely revisions based on past history* while conducting periodic analyses of the reliability[30] of the revised estimates. (See Box 3, which is an extract from the BEA news release concerning the expected changes to the "preliminary" and "final" GDP estimates of fourth quarter 2002. The box also shows historic comparisons of the quarterly revisions.)

A recent analysis of the reliability of the revised estimates—the fourteenth of its kind—concludes that revisions[31]: have no "momentum," that is, they do not have a bias that could predict future revisions; and they are explained largely by the use of new information/definitions.[32] For example, the classification of computer software as investment and similar improvements in the 1999 comprehensive revision raised the GDP growth rates, on average, by 0.4 percent in the later half of the 1990s. The mean of the revisions has positive sign reflecting improvements in coverage. Further, while the aggregate effect of the revisions has diminished over time—on average, from a little over 1 percent (in absolute terms) difference in quarterly GDP growth since the early 1980s, to 0.7 percent in recent years, the revisions in the GDP components may be significant. For example, in the 1996 comprehensive revision the reclassification of the purchases of the Commodity Credit Corporation as belonging to the business sector instead of the government sector were significant but they did not effect GDP growth because the impacts were offsetting. On the other hand, the definitional improvements in the 1999 comprehensive revision (such as the

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[28] Major changes in the latest 1997 benchmark I-O accounts include the incorporation of NAICS, which provides a new treatment of the service activities of central administrative offices and other types of auxiliaries, and a more detailed presentation of the service industries. For details see Lawson, Bersani, Nader and Guo (2002).

[29] BEA (2002).

[30] The ability of the "successive vintages of GDP estimates to present a consistent, general picture of the economy" (Fixler and Grimm, 2002).

[31] Fixler and Grimm (2002). The study used two measures of reliability: the mean revision, defined as the average of the difference between the percentage changes in the earlier and later quarterly estimates, and mean absolute revision, defined as the average of the absolute differences in the two estimates.

[32] There is also evidence to the contrary. For example, Runkle (1998) finds that initial estimates are not accurate and are biased in terms of predicting the final estimates.

reclassification of computer software as investment mentioned earlier) were augmenting and resulted in increasing the GDP growth rate by 0.4 percent in the later half of the 1990s.

Box 3: Historic Size of Revisions

The table below shows comparisons of the revisions between quarterly percent changes of GDP for the different vintages of the estimates. These comparisons can be used to assess the likely size of future revisions. For example, two-thirds of the revisions between the quarterly change in the advance estimate of real GDP and that in the final estimate were within a range of -0.6 to +0.9 percentage point. Thus, based on past history, the fourth-quarter change in real GDP, now estimated at 0.7 percent at an annual rate, is not likely to be revised below 0.1 percent or above 1.6 percent in the next two releases.

Revisions Between Quarterly Percent Changes of GDP: Vintage Comparisons
(Annual rates)

Vintages Compared	Average without regard to sign	Range	
		Two-thirds of revisions	Nine-tenths of revisions
	Current-dollar GDP		
Advance to preliminary	0.6	-0.5 to 0.8	-0.9 to 1.4
Advance to final.....	.7	- .7 to 1.0	-1.0 to 1.6
Preliminary to final.....	.3	- .3 to .4	- .6 to .7
Advance to latest.....	1.3	- .6 to 2.0	-1.8 to 3.6
Preliminary to latest.....	1.2	-1.0 to 1.6	-1.5 to 3.0
Final to latest.....	1.2	-0.9 to 1.8	-1.6 to 2.9
	Real GDP		
Advance to preliminary.....	0.5	-0.5 to 0.7	-0.9 to 1.2
Advance to final.....	.6	- .6 to .9	-1.0 to 1.3
Preliminary to final.....	.3	- .3 to .4	- .5 to .6
Advance to latest.....	1.4	-1.1 to 1.9	-1.5 to 3.2
Preliminary to latest.....	1.3	-1.0 to 1.9	-1.7 to 2.8
Final to latest.....	1.4	-1.1 to 2.1	-1.7 to 3.0

NOTE. These comparisons are based on the period from 1978 through 2001 for the first three comparisons in each group, and on the period from 1978 through 1999 for the last three comparisons in each group.

Source: BEA News Release, January 30, 2003 (http://www.bea.doc.gov/bea/newsrel/gdpnewsrelease.htm)

The Policy and Practice of Revising the Balance of Payments Statistics in Australia

The policy and practice of revising Balance of Payments (BOP) statistics of the Australian Bureau of Statistics (ABS) has three noteworthy features:

- A regular and transparent schedule is followed.
  - Revisions are timed to make the BOP estimates consistent with national accounts estimates.
  - Revisions are documented and explained.

- Major methodological revisions are explained in advance.
  - Users are consulted.

- The results of analyses of revisions are taken into account in revising the data for the subsequent periods.

(i) *Revisions follow a regular and transparent schedule.* The BOP estimates for the current financial year (which ends in June) are revised at quarterly intervals. The revised data are published in the quarterly publication *Balance of Payments and International Investment Position*, and in the July, October, January and April issues of the monthly publication *International Trade in Goods and Services* (see Box 4, which is the schedule of quarterly revisions). The quarterly revision of the BOP estimates reflects the periodicity of several BOP data sources. Estimates of trade in goods are based on timely and reliable customs data. These data are updated daily, so revisions feed through very quickly. In contrast, services estimates are based predominantly on data collected by the quarterly Survey of International Trade in Services, whose results are available three months after the end of the reference period. Services estimates for the latest periods are therefore extrapolated and are replaced with the survey-based estimates when they become available.

In general, more accurate information is incorporated into the estimates as soon as possible. However, the monthly data are normally not revised in the first month of a quarter so as to minimize disruption to the historical series, and to keep the monthly and quarterly series consistent. Revisions to the BOP estimates relating to investment income and capital account for the periods prior to the current financial year are only made twice a year. Other BOP data prior to the previous financial year are also revised twice a year. The revised data are published in the July issue of the monthly publication *International Trade in Goods and Services*, and in the June issue of the quarterly publication *Balance of Payments and International Investment Position*. Exceptions to this rule may be made in case of significant revisions that are important enough to require immediate publication.[33]

[33] ABS (1998)

Box 4: Quarterly Revisions

September	1. Previous 4 quarters for: Income Current Transfers Capital Account Financial Account International Investment levels 2. Previous 16 quarters for: Goods Services
December	Previous 5 quarters
March	Previous 6 quarters
June	1. Previous 15 quarters for: Income Current Transfers (In case there are offsetting revisions to services the data for 7 quarters are revised in June. Other revisions are implemented in September.) Capital Account Financial Account International Investment levels 2. Previous 7 quarters for: Goods Services

Source: ABS (2002)

To ensure consistency with the national accounts, the timing of the BOP revisions closely follows the national accounts revisions and benchmarking policy. Specifically, if revisions are being considered to the BOP and IIP data outside the regular revision schedule and prior to three years from the reference year, the national accounts staff is consulted on the implications of such revisions for the consistency of the BOP and national accounts, including when major revisions are incorporated.

Revisions are documented and explained. The quarterly *Balance of Payments and International Investment Position* publication includes a table summarizing the revisions that have been made since the previous issue. The publication also has notes that explain why the revisions were done. More lengthy listings of revisions are given in the annual publication (see Box 5, which reproduces text pertaining to revisions from the quarterly BOP and IIP statement and the annual publication).

Box: 5 Explanation of Revisions

Quarterly statement:
Seasonally adjusted and trend estimates of the current account have been revised as a result of the annual seasonal reanalysis which takes account of information that has become available since the previous analysis. Revised historical and new forward seasonal factors to September 2003 were released on 20 November 2002.

Incorporation of the latest available survey and administrative data has resulted in revisions to the current account back to March quarter 2000, reducing the 2001-02 current account deficit by $405m. The financial account and international investment position have been revised back to September quarter 2001, decreasing Australia's net IIP liability as at 30 June 2002 by $5b.

Annual publication:
Revisions have decreased the deficit on current account by $205 million in 1998-99. Chain volume measures and associated price measures incorporate a new base year (1998-99), which has resulted in revisions to levels for all periods.

There have been substantial revisions to the financial account and international investment position (IIP) back to the September quarter 1988. The revisions are the result of methodological changes, improved reporting and the identification and correction of errors. These are detailed below:

Currency and residual maturity of foreign debt
(a) A method has been applied for allocating a residual maturity to Commonwealth Government and State and Territory Central Borrowing Authority securities issued in Australia and held by nominees on behalf of non-residents. These $A debt securities were previously classified as unallocated. The new method, applied from 1999-2000, uses the identifying information for each line of stock reported by nominees as held on behalf of non-residents to apply the appropriate residual maturity.
(b) Financial derivative assets and liabilities have been allocated to currency and residual maturity categories from 1999-2000.

Valuation of unlisted equity assets
The reported valuations for foreign investment in unlisted equities issued in Australia and Australia's direct investment abroad in unlisted equities have been reviewed. While a range of valuation bases are used by investors to report their equity holdings, these are not always a good practical approximation to the market price valuation required in international investment position statistics. Where the reporting basis used is historic acquisition cost, this can diverge significantly from market valuation.
(a) Foreign investment in Australia (FIA)
Analysis of company reports and other sources, and contact with the more significant direct investment enterprises in Australia, have resulted in market price valuations now being applied. Coverage problems have also been identified and rectified.
(b) Australian investment abroad (AIA)
For a number of unlisted investments abroad the ABS has estimated market valuations based on a variety of indicators obtained from published company accounts and other public sources as well as on information from reporting businesses. The level of direct equity investment abroad and the changes in investment position due to market price changes have been revised from 1993–94.

The ABS will closely monitor reported values to avoid any future wide divergence from market prices.
These valuation changes do not affect BOP transactions or any foreign debt measures.
Improved use of expanded individual security reporting has led to the identification and correction of errors in the sector classification of the Australian issuers of both debt and listed equity securities. Significant errors in the market price valuation of these securities and coverage deficiencies have been rectified. The analysis also identified some non-resident issues in Australia being reported as Australian liabilities, which overstated Australia's external debt.
Ongoing analysis of reported IIP information in the context of the financial accounts of the Australian national accounts has identified reporting errors which have been rectified.
Financial derivative asset and liability positions previously reported on a net basis are now reported on a gross basis.

Source: ABS (2002i) (2001)

(ii) *Major methodological revisions are explained in advance.* The compilation and presentation of the BOP data in accordance with the IMF's *Balance of Payments Manual* (*BPM5*) that started in December 1997 was announced by ABS in September of the same year. The ABS is committed to implementing in full the revised *BPM5*. A description of the new standard was provided by ABS to the users, including illustrations of sample draft data tables.[34] The strategy to implement the *BPM5* recommendations was outlined, and the benefits accruing to Australia from adopting the standards were explained, including compilation of consistent rest-of-the world accounts, balance of payments, and other national accounts components. Prior to that, in December 1994, ABS published a paper, which discussed the effects of implementing *BPM5* on Australia's statistics.[35]

Consultations with key users to assess timetable and priorities for implementing BPM5 started in November 1994. Following these consultations, an article and discussion paper on the issue were published. The implementation proposal was modified and, in 1995, a wider range of users was approached. Users were invited to provide feedback on the revised implementation proposal and to participate in user forums to discuss the proposal. Data providers were also consulted to determine the feasibility of collecting adequate source data, as well to brief them on the implications for collecting data to support the new standard.

(iii) *The results of analyses of revisions are taken into account in revising the data for the subsequent periods.* The analyses typically focus on the direction of the revisions (or bias in the initial BOP estimates), and magnitude of revisions (or dispersion of the latest estimates from the initial estimates). One such analysis of the estimates relating to the balance of current accounts covered the period 1986 to 1994.[36] As a consequence of this study, to remove the bias in subsequent estimations of the current account balance, major revisions to the debit items are postponed until the updated data for the credit items become available.

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[34] ABS (1997).

[35] ABS (1994)

[36] ABS (1996). Among other things the study found that the initial estimates of several items were understated (negatively biased), and "the median initial estimate of the current account balance is close to the median final estimate but moves away with the first quarterly revisions and continues to worsen the overstatement of the deficit through to the fifth revision point before improving (in subsequent quarters)." The reason for the bias was that the debit items were revised earlier than the credit items because the data on the credit items became available later.

Revision Practices of Selected Countries

Appendix III presents extracts pertaining to revision policy and practice from the Reports on the Observance of Standards and Codes (ROSCs)[37] of eight countries from different regions of the world:

- Chile
- Estonia
- Italy
- Korea
- Norway
- South Africa
- Turkey
- Ukraine

The extracts that are presented are grouped by country and then by dataset: national accounts, prices (with relatively few extracts because price data are typically revised less often), government finance statistics, monetary statistics, and balance of payments. The paragraphs are numbered from 1 for Chile (national accounts) to 120 for Ukraine (balance of payments). Table 1 serves as an index to the extracts.

More specifically, the extracts are drawn from the Detailed Assessments volume of the data module ROSCs. These volumes follow the structure of the Data Quality Assessment Framework (July 2001 vintage).[38] The extracts relate to three of the framework's six dimensions:

- Dimension 1. Integrity: 1.2.4 Advance notice is given of major changes in methodology, source data, and statistical techniques.

- Dimension 3. Accuracy and reliability: 3.5.1 Studies and analyses of revisions are carried out routinely and used to inform statistical processes.

- Dimension 4. Serviceability: 4.4.1 Revisions follow a regular, well-established, and transparent schedule; 4.4.2 Preliminary data are identified; 4.4.3 Studies and analyses of revisions are made public.

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[37] The ROSCs are on the IMF's website http://www.imf.org/external/np/rosc/rosc.asp. This website also has background information about the standards and codes initiative of which the ROSCs are part.

[38] For more information about the framework, see http://dsbb.imf.org/Applications/web/dqrs/dqrsdqaf

Table 1. Examples of the Good Revision Practices Drawn from ROSCs

	Good practice identified in the paper[1/]	Country [paragraph number]
1.	Consultations with users elicit views concerning revision policy and practice.	
2.	A clear, short summary statement of when to expect revisions and why is readily accessible to users.	Norway [64], [76], [80], [83]
3	The current revision cycle is relatively stable from year to year.	Chile [1], [4], [7]; Estonia [11, [15]; Italy [30–31], [36]; Korea [44]; [53], [57]; Norway [64], [76], [80], [83]; South Africa [85]; Turkey [101], [103]; Ukraine [114], [118]
	3.1 Revisions are timed to incorporate new source data.	Estonia [11], [16]; Norway [65]; South Africa [89]; Ukraine [115]
	3.2 The revision schedule takes into account the timing for preparing important official policy documents (e.g., the national budget).	Italy [30]; Norway [65]
	3.3 The revision schedule takes into account the timing of revisions in other datasets.	
4.	Major conceptual and methodological revisions are usually introduced every four to six years, balancing need for change and users' concerns.	Italy [31], [55]; Korea [48]; Norway [64]; Turkey [100]
5.	Revisions are carried back several years to give consistent time series.	
6.	Documentation on revisions is readily available to users.	Estonia [19]; Italy [32]; South Africa [88], [95]
	6.1 Preliminary (or provisional or estimated) data and revised data are identified as such.	Chile [1, 2], [10]; Estonia [28]; Italy [38]; Korea [45], [54], [58]; Norway [77], [80]; South Africa [87], [89–90], [97–98]; Turkey [106], [109], [112]; Ukraine [114], [116–117]
	6.2 Advance notice is given of major changes in concepts, definitions, and classification and in statistical methods.	Estonia [16]; Korea [43], [49], [52], [56]; Norway [60–61], [69-71], [75], [78], [82]
	6.3 The sources of revision are explained when the revised series are released.	Italy [32], Korea [46], [59]; Norway [62], [67], [70], [72], [73], [84]; Turkey [102], [108]; Ukraine [114]; [119–120]
	6.4 Breaks in series are documented when consistent series cannot be constructed.	
7.	Users are reminded of the size of likely revisions based on past history.	South Africa [88], [99]
	7.1 Periodic analyses of revisions investigate the sources of revision from earlier estimates and statistical measures of the revisions (e.g., dispersion and bias).	Norway [79], [81]
	7.2 The analyses are published for major aggregates to facilitate assessment of the reliability of the preliminary estimates.	Norway [79], [81]
8.	When a mistake in reporting or processing is made, the revision is made in a transparent and timely manner.	Norway [84]

1/ Several good practices identified in the table are not illustrated because the Data Quality Assessment Framework, on which the ROSCs are based, does not focus on them.

Chile

[1] Chile has an established policy, governed by Central Bank of Chile, on the revision of **national accounts** estimates. The first data published for each given period are provisional, and are identified as such. The annual estimates include a preliminary estimate in March of the year following the reference period, a preliminary comprehensive estimate 14 months following the reference period, and a revised estimate 26 months after the end of the reference period. The series are generally subject to revisions over long periods whenever the base year is updated and changed. The historical quarterly national accounts are revised in accordance with the revisions in the annual accounts. The quarterly accounts for the current year are revised upon receipt of more complete information in the course of the year.

[2] The revision policy identifies the status of the data. In particular, the provisional and revised data are identified in tables.

[3] Revisions are analyzed only internally, and not in a systematic way. The exception is the revision related to the new base year, for which full documentation of revisions and their causes is provided.

[4] The release of revised **government finance** data follows a well established and understood schedule. The data for the first three quarters of the year are revised at the time the data for the fourth quarter are released (i.e., 60 days after the end of the quarter in the past, 45 days beginning in 2001). The data for the fourth quarter and for the year as a whole are final when first released.

[5] Preliminary and revised data are not identified in the published statistics. However, users are aware of the revision policy followed by the Budget Directorate. The revised data are disseminated in the same way, and at the same level of detail, as the original data. Finally, the coherence between preliminary and final data is sufficient to allow preliminary data to be used with confidence for policy determination and analysis.

[6] Revisions incorporate all material data changes resulting from available up-to-date data. No time series of revisions to data is made available. The revisions made are based on supporting documentation. Finally, no analyses of preliminary versus revised data published for major government finance statistics aggregates for the preceding periods are conducted.

[7] Revision policies for **monetary statistics** follow a regular pattern. The data for the Central Bank of Chile and the other depository corporations surveys are preliminary when first released and are finalized within one month and two months, respectively, except in case of the year-end data, which are finalized three or four months after the end of the reference year. However, final data are not frequently checked against preliminary data.

[8] Revisions made to the Central Bank of Chile and the other depository corporations' surveys are clearly identified in the fortnightly and monthly reports of the Central Bank of Chile and in the statistical releases posted on the web site.

[9] The **balance of payments** data are provisional when first released and are revised during the fifteen months following the first release when more accurate source information becomes available. Final annual data are published in the *Chilean Balance of Payments*. The public is informed of major changes in methodology through a press release, conference and/or a note or article published in one of the Central Bank of Chile's publications.

[10] Preliminary data are clearly identified in the text and in the tables.

Estonia

[11] Revised **national accounts** data are released according to a regular, well-established, and transparent schedule. The release and revision dates are coordinated with the arrival of major data sources but not with the timing of preparation of important official economic policy documents. There are no known instances where the release of national accounts data was advanced, or retarded, to take account of policy announcements.

[12] There is a general statement about revisions in each publication but it is not clear from the statistical tables as to which data have been revised.

[13] Revisions do not appear to be systematically tracked, as a gauge of reliability, and mined for the information they may provide. In seven of the 12 quarters from quarter 1, 1996 to quarter 4, 1998 the difference between the preliminary and final GDP estimates was less than 1.0 percent. In a further two quarters, the difference was between 1.0 percent and 2.0 percent. In a high proportion of quarters, the preliminary estimate was a sound predictor of the final estimate.

[14] Revised data are made available in publications as a matter of course. However, analyses of revisions are not carried out.

[15] A calendar of precise release dates for the entire year is published at the beginning of the calendar year. This results in the release of annual and quarterly data in a quite stable pattern from year to year. The advertised dates are usually achieved so there is reasonable predictability for users. There are occasional slippages, for example in situations where the results of new data sources need to be incorporated or when there are a number of revisions to back series.

[16] The release and revision dates are coordinated with the arrival of major data sources. New source data are incorporated in national accounts publications as soon as possible after the Macroeconomics Statistics Division is satisfied with the ongoing reliability of the data in question. The statistical agency does not suppress, permanently or temporarily, any source data, which would lead to the revision of national accounts statistics. There appears to be no recent instance of advancing the timing of release of national accounts statistics to allow incorporation in important official economic policy documents.

[17] A major recent development has been the incorporation of the results of the supply and use tables for 1997 into the GDP estimates at current and constant prices. This has resulted in revisions to annual and quarterly GDP data by activities, back to 1993. Revisions have also been made to GDP according to the expenditure approach, both for total GDP and at the level of the seven major components. Initially, the published revised series will relate to annual data. It is planned to publish the revised data in June 2001 and to convene a media conference to announce and explain the revised data. Quarterly data will be supplied later on request. Alternatively, users will be informed that quarterly data may be simply derived by applying the ratio between the original and revised annual data.

[18] The status of data, whether preliminary, final, or revised, can usually be deduced from the methodology statements accompanying publications. The methodology statements make clear, in general terms, which data are final and which data are preliminary.

[19] Candid documentation is published on sources and methods of revising the data. However, the documentation does not give explicit information on matters such as the direction and magnitude of revisions; the main flows of data from the preliminary to the revised versions; the reasons for revisions (except in quite general terms).

[20] Some of this information is made available to major users.

[21] Revisions to weights of the **consumer price index** are now made on a regular annual basis and it is planned that they will occur with the release of the index for January each year. The revisions are announced about four months in advance in the monthly publication *Estonian Statistics*. Revisions are not made to index series; these are final when released. No revisions are made to consumer price index data.

[22] There is a revision policy in place for **balance of payments statistics**. Revisions to the provisional quarterly data of the current year are published together with the provisional data for the following quarter. Revised annual data are published together with the provisional data for the first quarter of the year, and usually can be considered final. In some cases, if the need arises, extraordinary revisions are made although data were considered final. Revisions of a more historical nature may also take place if an important methodological change occurs. A revision policy for the monthly key items is not in place. The data are preliminary when first released and are revised on a quarterly basis as additional information is received. In such cases, the data are marked as revised, although the periods that have been revised are not indicated.

[23] In the Bank of Estonia's balance of payments statement, published in the press release and its monthly bulletin, it is indicated that after the receipt of additional information, data for earlier periods have been updated accordingly. However, there are no markings indicating which periods have been revised.

[24] Studies and analysis of revisions are carried out as and when the need arises and studies done will be made public provided the confidentiality of the data underlying these

studies is preserved. Until now, however, the need for studies and analysis of revisions has not arisen.

[25] Monthly **government finance** data are revised during the year. The cumulative operations at the end of the previous reference month are deducted from the cumulative operations at the end of the reference month. Therefore, there is an implicit revision of monthly data. Final annual data are disseminated to the public no more than nine months after the reference year.

[26] Preliminary data are clearly identified in Ministry of Finance publications. Studies and analyses of revisions are not routinely made.

[27] Because, in general, the **monetary data** are final when first released, revisions are infrequent. In the few instances where some of the data are preliminary, users are informed of the schedule of revisions of the data. Data revisions are needed when there are changes in the chart of accounts of depository corporations or when major methodological improvements are implemented, which requires the revision of historical time series to reflect these improvements. Users are informed about these revisions in the data.

[28] Preliminary and revised data are clearly identified in disseminated formats. Comments on preliminary data or retroactive changes are always included in notes. All revised data are indicated with underlines.

[29] No studies and analyses of revisions are carried out routinely. However, errors and data shortcomings in the reports supplied by credit institutions are the focus of internal analyses.

Italy

[30] The recurrent revisions in both the **annual and quarterly national accounts** follow an established cycle. The first, provisional, annual GDP estimates are released within two months of the year following the reference year. They are used in the General Report on the Country's Economic Situation presented to Parliament in early April. The estimates also serve to calculate the deficit/GDP ratio as required by the Maastricht protocol. The provisional annual estimates may be revised three times in the succeeding three years. The revised results are published on March 1 of each year.

[31] The preliminary quarterly GDP estimates at constant prices and seasonally adjusted estimates are published 45 days after the end of the reference quarter with the exception of the first estimate of four quarters, which is released on March 1 to coincide with the release of the annual estimates. The preliminary quarterly estimate is revised 70 days after the reference quarter. The quarterly data are continuously revised during the year including the data of the two previous years. By March of the succeeding year the revisions in the quarterly data may cover as well the data for the previous four years. The annual and quarterly data series may be changed further when major revisions are introduced. The latest such revision

was decreed by EU requirements. In the future, major revisions will have quinquennial periodicity as agreed by agencies in the EU statistical system.

[32] The revised data have the same or greater level of detail as the earlier data. To avoid breaks in the series and distortion in growth rates, major new source data are not incorporated immediately in the accounts but at the time of major revisions. The users are not always alerted that the initially published data are preliminary and subject to revision. Neither are the data presented in tables flagged as subject to later revision. However, when revisions occur they are assessed and explained with the publication of the statistical series. Detailed documentation on major revisions is provided in different media: hard copy, Internet, press releases, and dedicated seminars.

[33] The publication of **general government statistics** follows a regular and well understood pattern whereby initial data are preliminary and are subsequently replaced by final data. Preliminary data are not clearly identified by the Ministry of Economy and Finance nor is there a general comment in their publication on the revision policy used (e.g., unless otherwise indicated, data are preliminary when first released). The data are published showing cumulative current period data and the equivalent data for the previous two years. No specific studies or analyses of routine revisions are made public. On the other hand, the statistical office publishes several analyses and descriptions when extraordinary revisions are made (e.g., in 1999 in order to adopt the European System of Accounts 1995 system).

[34] There are no revision studies. Revisions mainly result from the routine replacement of preliminary data by final audited data. Very rarely, the final data may be revised as a result of new data. The introduction of *European System of Accounts 1995* has had a major impact on a wide range of macroeconomic statistics, including for general government. Revisions have been made to the national accounts time series back to 1980. In addition, the general government sector data of the National Institute of Statistics will be revised if the EU decides on a different treatment from that adopted by Italy with regard to new arrangements (such as securitization) in the national accounts.

[35] The revisions in **money and banking statistics** are very small. The Monetary and Financial Institutions (MFI) balance sheet statistics reported in the *Supplements to the Statistical Bulletin* are provisional for the latest month and include estimated values (e.g., the figures for the period from December 1995 to May 1998 and the latest figures for money market funds). The explanatory notes to the *Supplements to the Statistical Bulletin* state that estimated data are subject to revision. Studies and analyses of revisions to investigate the sources of errors and fluctuations are not carried out routinely, and the methods of revising the data are not explained. Based on the experience of the staff, deviations, omissions, and other potential sources of problems in the data (e.g., erroneous sectorization of institutional units) are identified and investigated.

[36] The latest data on the Bank of Italy are considered final. Monthly data of the other MFIs are provisional and, like estimated data, subject to revisions. In accordance with the principles and guidelines on revision policy set out by the ECB, revisions are carried out at

the time of the next release; once the revisions are incorporated, the data are considered final. The Bank of Italy informs the users in the methodological appendix of the *Supplements to the Statistical Bulletin—Monetary and Financial Indicators* that the figures for the most recent months may have been affected by revisions in the reports submitted by banks.

[37] According to the Eurosystem revision policy, national central banks in the euro area should not need to systematically revise data outside the ordinary date range (so called exceptional revisions). Significant data revisions applied to values related to a period prior to the month preceding the current reference month—not due to grossing-up or to minor revisions—and any exceptional revisions are to be explained to the ECB by means of explanatory notes. According to the Bank of Italy, the only significant revisions made to date refer to reconstructions of time series—several of which occur from 1990 onwards—to take account of the introduction of uniform reporting of balance sheet data in May 1998 for the entire universe of Italian banks and the harmonization of monetary statistics with ESCB statistical requirements (see 4.3.2). The *Supplements to the Statistical Bulletin* provide information on these significant revisions.

[38] Users are alerted in the methodological appendix of the *Supplements to the Statistical Bulletin—Monetary and Financial Institutions: Banks and Money Market Funds* that the data on MFIs for the latest month are provisional. Provisional figures are in parenthesis. The revised data are disseminated in the same way, and at the same level of detail, as the data being revised. Revised data are not marked in the tables. Revisions are normally negligible; significant revisions are explained in the methodological notes.

[39] The Bank of Italy does not provide information on studies and analyses of revisions to the public. According to the Research Department, revisions in monetary data are normally very small. No analysis of the preliminary versus revised data is being published for major aggregates to allow an assessment of the reliability of the preliminary data.

[40] Revisions of the **balance of payments statistics** are recorded and assessed on an ongoing basis. In case of revisions stemming from a major break in the approach followed to collect the data, surveys are conducted to anticipate the likely direction of the revision. In some cases the studies are made available to the public (such as the new survey on tourism). The more day-to-day revisions are studied informally with frequent exchange of views between staff and managers.

[41] Revisions of the monthly figures are published in the Foreign Exchange Office's *Statistical Bulletin* about 90 days after the end of the reference month (source of information: the Foreign Exchange Office press release on the balance of payments). Further revisions are included when the *General Report on the Economic Situation* (Relazione Generale sulla Situazione Economica del Paese) is published in March by the Ministry of the Treasury and in May when the BI publishes its *Annual Report.* In all Foreign Exchange Office and Bank of Italy publications, both online and paper versions, preliminary data are clearly identified.

[42] Studies and analyses of revisions are made available only when major methodological changes occur, or when there is a break due to a new collection system. This is done by a press release followed by an explanation of the reason underlying the change and the expected impact on the data. For instance, when the Italian balance of payments was brought to full consistency with the *BPM5*, the changes were explained in a Foreign Exchange Office press release on April 21, 1999.

Korea

[43] For **national accounts,** advance notice is given of major changes in methodology, source data, and statistical techniques such as changes in the base year introduced in 1999 (using 1995 base). Also, the detailed plan for adopting the *System of National Accounts 1993* (*1993 SNA*), scheduled to be implemented in 2004, has been published.

[44] Previous quarterly estimates within the same calendar year are revised when the figures for the next quarter are first published. They are subject to further revision when the figures for the full year are released. The annual and quarterly figures can also be revised when the annual estimates for the following year are published. After this, they are normally only revised at the time of the five-yearly rebasing. This revisions policy is clearly stated in the *Guide to Economic Statistics*.

[45] Preliminary annual and quarterly figures are indicated by putting the letter ‘p’ next to the data. Similarly, the letter ‘r’ is used to indicate revised estimates.

[46] When releasing the final annual figures, factors contributing to the difference between preliminary and final data are analyzed and explained in *Quarterly National Accounts*.

[47] The revision of the **CPI** to introduce new weights and item structure is announced at lease six months in advance. At the time of the announcement, the new item structure is identified. There have not been any major changes in CPI methods in the recent past so no announcements have been required. For the upcoming revision, there will be no major change in methods introduced. There will, however, be a new supplemental index which uses annual weight updates, i.e. a chained Laspeyres index. The availability of this new index will not be announced in advance.

[48] Revisions to date have been in accordance with standard ILO guidelines to update weights on a five-year cycle.

[49] Changes in methodology for compiling **government finance statistics** require changes in the Budget and Accounting Act for the year in which the changes would take place. The changes are announced publicly in a draft form and comments are sought form the public for a period of 20 days. Comments received are taken into account before the changes are finalized and included in the relevant Budget and Accounting Act.

[50] Minor revisions to monthly data are incorporated in the monthly cumulative data disseminated for the following month(s). Starting in 2001, a final revision to monthly data takes place at the time annual data are considered final (in May of the following year).

[51] Monthly data released indicate that data are preliminary.

[52] Advance notice and explanations are provided when major statistical methodological changes in **monetary statistics** are envisaged. For instance, users have been notified, via the ministry and central bank websites, of plans to introduce revised monetary aggregates based on the concepts and definitions recommended in the *Monetary and Financial Statistics Manual.*

[53] A timetable for the release of preliminary and final data is provided in the Bank of Korea's *Guide to Economic Statistics*, April 2001. Revised data are also clearly indicated in the Bank of Korea's publications. In addition, the revision and release procedures are documented in the *Guide To Economic Statistics,* April 2001.

[54] Preliminary monetary aggregates, calculated on the basis of summary reports provided by the banks, are clearly indicated as such in the Bank of Korea's publications.

[55] The monetary statistics team analyzes changes between preliminary and final data. Material data revisions by reporting institutions are investigated by the monetary statistics team.

[56] The press was informed in advance when the Bank of Korea was preparing to convert the **balance of payments statistics** to the *Balance of Payments Manual,* fifth edition, and when it was planning to introduce advance release calendars for its statistical products. New statistical initiatives are also sometimes announced in audits of the Bank of Korea by the National Assembly, e.g., plans to introduce international investment position statistics. In the future, the Bank of Korea plans to provide users of statistics with advance notice of major changes in methodology, source data, and statistical techniques.

[57] Preliminary monthly balance of payments statistics are available at the end of the following month. Revisions are made when there is a change of over US$30 million a month in the import-export statistics and when data from the monthly reporting system are revised. The monthly and annual balance of payments statistics of the previous year are finalized during June–July of the following year. Further changes are seldom made, but at the time of finalizing the 1999 figures the balance of payments statistics for 1998 were also revised. An outline of the statistical revision policy is provided in the Bank of Korea's *Guide to Economic Statistics* and work is underway to post the revision policy on the Bank of Korea website.

[58] In the Bank of Korea's statistical publications, the preliminary data are identified with the letter "p."

[59] When the final balance of payments figures are released, factors contributing to the difference with the preliminary statistics are analyzed. In most cases, they result from the revision of the import-export statistics, foreign exchange receipts and payments, other source data, additional data collected from companies or related associations, and the correction of errors. In the briefings to the press, the causes of the revisions are explained and some written explanations of the revisions are presented in the press release.

Norway

[60] In **national accounts** there have been two major changes in methodology, source data, and statistical techniques during the last decade: The 1995 Main Revision, where the 1993 *System of National Accounts* (*1993 SNA*) and the 1995 *European System of Accounts* (*1995 ESA*) were also introduced, and the 2002 Data Revision, where important new data sources and updated classifications were introduced.

[61] In both cases, advance notice was given by Statistics Norway. The extent of the Main Revision, the work in which took place over a five-year period, was first announced in an article in *Økonomiske Analyser (Economic Survey*) in 1991, and later in comprehensive article in *Økonomiske Analyser* in 1994, and in various other connections. The Data Revision was outlined in a box in *Economic Survey* in February 2002, and also mentioned in the Statistics Norway's *Annual Report* for 2001 as the major project to be completed in national accounts during 2002. Advance notice concerning release of the subsequent backwards series has been given with a shorter notice.

[62] In published documentation on the 1995 Main Revision, there are analyses in great detail of the results of the revision compared to the previous data. The changes are subdivided into those that are caused by new definitions and classifications (formal changes), and those that are caused by new or improved source data (real changes). Similar analyses are carried out in relation to the 2002 Data Revision.

[63] In the course of the current compilation of quarterly and annual national accounts, the direction and magnitude of revisions between the various versions are looked into. This may lead to changes in the way source data are utilized.

[64] The revision cycle for the Norwegian annual and quarterly national accounts is predetermined and reasonably stable from year to year. It is made known to the public on the Statistics Norway website for annual and quarterly national accounts statistics in the section "About the Statistics,"... The timetable for releases and the revision cycle is also described in publications in the series *Official Statistics of Norway* and in several documentation reports... New source data are incorporated as early as possible, if they do not lead to significant breaks in the time series. Otherwise the introduction in levels is postponed to the following main revision, but the new source data may in the meantime be used as indicators for growth rates. Following the 2002 Data Revision, Statistics Norway aims at main revisions with five–seven years interval in the future.

[65] The revision schedule is primarily governed by the availability of source data, but the timeliness of the releases in April and September is critical, as the Ministry of Finance uses these data in the budget process.

[66] Users are informed in the text of the releases that the initially published data are preliminary and subject to revision, but preliminary data are not labeled in any special way. Most often releases of quarterly data will only contain preliminary data. The revised data are disseminated with the same level of detail as previously published for the data being revised.

[67] Very comprehensive documentation was published in 1996 for the 1995 Main Revision... More summary documentation is also available. The 2002 Data Revision has been documented in several reports from Statistics Norway that explains also in detail the reasons for the Data Revision and the background for the particularly big revisions in some years. (See *Revised national accounts figures: Stronger growth in the 1990s* on the Statistics Norway website and in *Economic Survey* 2/2002, and several industry specific documentation *Reports* in both hard copy and on the Statistics Norway website.)

[68] No analysis of preliminary versus revised data is published on a current basis to allow assessment of the reliability of the preliminary data. Some comments are, however, made in the current releases, on the extent and causes of revisions. The latest published study on the relationships between preliminary and final annual data was published in 1990 and refers to the period 1972–87.

[69] In the **CPI,** advance notice is provided for major changes in methodology, source data, and statistical techniques. The changes are discussed with the Advisory Committee as early as 12 months in advance. Normally an article will be published on the CPI web page four to eight weeks in advance. Such notice was given in 1999 when geometric averaging and the COICOP classification were introduced. It was also given when the rent survey changed from quarterly to monthly collection. For minor changes, advance notice of several weeks is provided on the CPI website. The notice discusses the nature of the changes. In the press release there is a link to this notice.

[70] The CPI weights are revised every year in August with household budget survey data from the three previous years. As part of each revision, the CPI staff calculate the effects of the new weights on the published indices and explain this in an article or note for the press release. When major changes in methodology occur, as in 1999, detailed analysis of the effects of changes in classification, methodology, and weights are prepared. The analyses of revisions is used to guide future decisions on potential changes in methods and the CPI basket.

[71] The CPI weights are updated annually with the release of the August data. This is well known and users are notified several weeks in advance on the CPI web page about the new weights and basket to be introduced with August data.

[72] The CPI weights are revised every year with the data for August. As part of each revision, the CPI staff calculate the effects of the new weights on the published indices. For

major revisions, a detailed article explaining the changes and their effects is published. For example, a detailed article was prepared for the Statistics Norway journal *Economic Survey* to explain the changes in the 1999 CPI revision. This revision article analyzed the effects of introducing geometric averaging and discussed the new COICOP structure for the index. Another article on the CPI web page explained the effects of going from quarterly to monthly pricing of rents in January 2000.

[73] The weights of the version of the **PPI** subject to revision are revised every year with data for January. As part of each revision, the PPI staff calculate the effects of the new weights on the published indices. When major changes in methodology occur, as in 2001, detailed analysis of the effects of changes in classification, methodology, and weights are prepared. The analyses of revisions is used to guide future decisions on potential changes in methods and the index structure.

[74] The weights are updated annually with the release of the January data. This was announced at the time of the 2001 revision, which introduced the new index and appears in the metadata on the index website ("About the Statistics" and "Revisions"). There is no publicized revision policy other than the statement in these documents that the index is subject to revision at any time.

[75] Major changes in methodology for **government finance statistics** are announced to the public in advance. For example, the more limited GFS revision on the period 1990–2001 was announced four months in advance. The latest revision on the new Classification of the Functions of Government (COFOG) was announced four months in advance. Minor changes are explained simultaneously with the dissemination of the data.

[76] The publication of general government data follows a regular and well understood pattern whereby initial data are preliminary and are subsequently replaced by final data. The revisions policy is stated in the "About the Statistics" section of the GFS pages of the Statistics Norway website.

[77] Preliminary data are clearly identified with symbols in the Statistics Norway's publications, where the symbol of preliminary data is marked with an asterisk.

[78] Norges Bank's most recent two examples of its advance notice of changes in **monetary statistics** concern the monetary aggregates. The major change planned for the monetary statistics in October 2001 was announced in May 2001. The change in the calculation of growth rates that took place in the September 2002 release was announced in connection with the release of August 2002 data.

[79] Studies and analyses are conducted regularly and are disseminated on the Norges Bank website. The focus of such notes is a comparison of growth rates of major aggregates as between first (estimated or preliminary) data and final data. Generally revisions in M2 and C2 are small, but revisions in C3 are larger, reflecting the large order of magnitude of revisions of external sector data.

[80] The Statistics Department's revision policy is to disseminate revisions of the previous month's data together with the current month's data. This practice used to be noted in hard-copy publications, and is currently disseminated on the Norges Bank's website. Also, revised data are now shown with a blue color in the published statistics tables.

[81] Revision studies have been undertaken periodically and major studies have recently been made public on Norges Bank website.

[82] Statistics Norway provides articles on major changes in **balance of payments** methods, usually in *Økonomiske Analyser* and *Economic Survey*. An example of a major revision was the conversion to the *1993 System of National Accounts* (*1993 SNA)* and the fifth edition of the IMF's *Balance of Payments Manual* (*BPM5)*, when several definitions were changed and new concepts introduced. The revision was announced in general terms in *Økonomiske Analyser* and *Economic Survey* five months in advance, and a more detailed article on the effects was published simultaneously with the revised figures.

[83] Thre visions policy is stated in the "About the Statistics" section of the Statistics Norway website... Under this policy, data for all months of the current year are subject to revision. In subsequent years, the data are only revised once a year to coincide with changes introduced in the annual national accounts. The revisions policy is designed to take into account the flow of new data. Methodological changes are only implemented once a year.

[84] Significant revisions due to changes in methodology or revisions in the source data are noted in the commentary of the monthly balance of payments release. For example, the notes to the September 2002 release explain that a revision for an earlier month was caused by the identification of the import of an oil platform that had previously been omitted.

South Africa

[85] The release schedule for **national accounts statistics** is predetermined and stable from year to year and announced in advance of expected release dates.

[86] New source data are incorporated as early as possible and new source data, which indicate that previously released estimates should be revised, are incorporated within the constraints of the revision schedule.

[87] The preliminary and revised data are identified. The revised data are accessible on a sufficiently detailed level.

[88] Candid documentation is published on sources and methods of revising the data, providing in particular the direction and magnitude of revisions, the main flows of data from the preliminary to the revised versions, and the reasons for revisions.

[89] The quarterly **government finance** data are preliminary because they rely partly on sample survey data. The data are revised and adjusted accordingly when final data become available. Footnotes clearly state the status of the data to be preliminary over a period of two

years. Annual budget data are revised when the audited data become available. Debt data are final because they are from actual banking records.

[90] When applicable, footnotes indicate the preliminary status of data in tables of the South African Reserve Bank's *Quarterly Bulletin*, and the *Budget Review*. Notes in annexes of Statistics South Africa's *Statistical Releases* explain the status of data.

[91] The **monetary data** are considered final when first released in the "South African Reserve Bank Statement of Assets and Liabilities." Data for the Other Deposit Corporations (ODCs) may, in principle, be preliminary when first released in the *Monthly Release of Selected Data* since ODCs may submit revisions in their next return. In practice, revisions are rare and insignificant.

[92] Both the "Statement of Assets and Liabilities" and the *Monthly Release* are disseminated according to a predetermined schedule which is stable and announced three months in advance of the expected release dates.

[93] Data for the Central Bank Survey (CBS) are final when first released to the public. Since it is highly unlikely that data for ODCs may be revised, the publications do not include notes on the status of the data (preliminary or final). Data users treat them as final. However, the *Monthly Release* contains data for a five-month period and any revisions to that range of dates would be published in the following *Monthly Release* and in the *Quarterly Bulletin.* Regardless of the revision policy for published data, the Research Department database is always duly revised and updated.

[94] Final data used in the calculation of monetary and credit aggregates are usually not subject to revision and these aggregates are consequently not revised on an ongoing basis.

[95] The **balance of payments** data for the last four years are considered to be preliminary and subject to revision. Users are informed that revisions could result from: revised, more accurate up-to-date information received; better estimates for a particular period based on more complete coverage; changes in the conceptual framework.

[96] Revisions were made to the historical data on gold exports for 1992–96 during 1996, in light of new information on forward gold sales.

[97] A footnote to the balance of payments table in the *Quarterly Bulletin* informs users that data are preliminary and subject to revision (e.g., see *Quarterly Bulletin of the South African Reserve Bank,* September 2000, p.84).

[98] Users are alerted that statistics published in the *Monthly Abstract of Trade Statistics* are preliminary and subject to revision, and that all revisions to monthly figures may be included in the statistics for any subsequent period during the relevant calendar year.

[99] Revisions are measured, assessed, and explained to users.

Turkey

[100] The **national accounts** estimates of the first three quarters of the current year are revised at the time of the first estimation for the fourth quarter, and the estimates for all quarters of that same year are revised once more six months later. After that, as a rule, estimates for earlier years and quarters are not revised until a new benchmark year is estimated, every five to ten years. New source data tend to be incorporated at the time of major historical revisions, to avoid breaks in the series.

[101] The present revision policy has been in effect since the early nineties. Users are familiar with the revision cycle, which has been quite stable from year to year. The revisions are usually of small magnitude.

[102] The most recent major methodological document, GDP*; Concepts, Sources, and Methods*, was published by the SIS in November 1994. It dealt with the historical revision carried out from 1991 to 1994, which saw the development of the new quarterly GDP series, the elaboration of the 1990 input-output table, the revision of annual estimates back to 1968, and the rebasing of constant prices estimates from 1968 to 1987.

[103] The publication of **government finance statistics** follows a regular and well-understood schedule whereby initial data are preliminary and are subsequently replaced by final data. Final data are subject to subsequent revision, but this does not occur on a routine basis.

[104] Preliminary data are not clearly identified, but are notified by a general comment on the publication (e.g., “Unless otherwise indicated, data are preliminary when first released”).

[105] No time series or analyses of revisions to data, or of the relationship between preliminary and final data, are published. However, it is believed that preliminary figures are usually close to final figures, and can be relied upon for analytical purposes.

[106] Preliminary and revised data are identified. Users are made aware that data are preliminary and subject to revision. The revised data are disseminated with the same level of detail as those previously published.

[107] Revisions to the statistical series are mentioned in the press release and on the website.

[108] Monthly and weekly **monetary data** of deposit money banks are provisional. Banks may send revisions in their next return. In practice, revisions are rare and insignificant. Monthly data of the central bank are final. Data on banks are subject to revisions throughout the year, and become final the following year. Revisions due to important changes in statistical methodology are explained in the related publication.

[109] Users are alerted that the initially published data for banks are preliminary (data are marked with "*") and subject to revision. The revised data are disseminated in the same way, and at the same level of detail, as the data being revised.

[110] Only major differences between preliminary and revised data are explained in a footnote.

[111] There is no predetermined revision cycle of **balance of payments statistics**.

[112] Preliminary data are identified in balance of payments statistics releases. The revised data are disseminated with the same level of detail as previously published for the preliminary data.

[113] When major revisions to balance of payments statistics are made, the revision is announced on the central bank's website. For example, the measurement of services and income credits in the balance of payments was revised in early 1999 and the announcement posted on the website simultaneously.

Ukraine

[114] The **annual and quarterly national accounts** are revised once according to a predetermined schedule. However, the revision period of one year for national accounts does not permit the incorporation of the latest balance of payments data that are finalized after 15 months. Similarly, the revised quarterly national accounts do not incorporate the latest results of the household survey that are prepared four months after the end of the reference quarter. The revision to the final GDP estimate is generally small. However, the procedures for revising the data are not explained. The preliminary data are identified. The revised data are disseminated with the same detail as the preliminary data. In cases of major revisions, the sources of data revision are indicated to show the difference from the preliminary figures.

[115] Revisions of **government finance statistics** are generally very small. They arise from one source—the incorporation of audited annual accounts, which takes place in June each year.

[116] The first estimate for the year—the 12-month estimate—is labeled as preliminary.

[117] There is no formal revisions policy for **money and banking statistics**. Revisions are infrequent and are made when needed, based on the availability of more accurate data. Revised data are identified as such in the publications. There is no mechanism in place to conduct routine revision studies. The National Bank of Ukraine staff believes that they are not relevant for monetary statistics, as the data are considered final when first published. However, deviations, omissions, and other potential sources of problems in the data (e.g., erroneous sectorization of institutional units) are identified and investigated. The results of these ad hoc studies are not made available to the users. Since it is highly unlikely that data will be revised, *Bulletin of the National Bank of Ukraine* does not include notes on the status of the monetary data (preliminary or final). Revised data are identified in publications, but

users are not informed on causes of revisions. Given the sporadic nature of revisions to monetary data, no studies and analyses are carried out routinely. However, errors and data shortcomings in the data reported by banks are the focus of internal analysis.

[118] The revision cycle for **balance of payments statistics** follows a long-established schedule: quarterly data are not revised until the publication of the fourth quarter data, at which time all quarters of the current and the previous year are subject to revision. However, this revision cycle is not clearly made known to the public, although major data users are generally aware of this schedule. The draft metadata provided to the Fund include a description of the revision policy and schedule, but have not yet been posted on the National Bank of Ukraine's website or included in the National Bank of Ukraine's publications. While the staff regularly conducts analysis of revisions, there are no published studies to review preliminary and final data and identify systematic source of errors or omissions.

[119] Any change in methodologies is documented in the sources and methods section of the quarterly *Balance of Payments* publication of the National Bank of Ukraine. The implementation of new data collection procedures follows an established schedule. For example, the staff has consulted banks concerning the revision of the threshold to provide detailed payment orders along with the information included in form 1-PB. Banks are informed that this change will be implemented following the adoption of a forthcoming resolution by the board of directors of the National Bank of Ukraine stipulating the date when these new reporting rules would become effective.

[120] The statistical tables included in the balance of payments publication and posted on the National Bank of Ukraine's website include footnotes highlighting and explaining major revisions. The website contains a note to the fact that quarterly data are provisional while data in time series format are "refined." However, the detailed analysis of revisions by standard components, including explanatory notes on the reasons as well as the sources of such revisions are not prepared.

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