DATA QUALITY: A COMPARISON OF IMF'S DATA QUALITY ASSESSMENT FRAMEWORK (DQAF) AND EUROSTAT'S QUALITY DEFINITION

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"Not everything that can be counted counts, and not everything that counts can be counted."
-Albert Einstein

INTRODUCTION

Issue

At the UN Statistical Commission meeting in March 2002, the IMF and Eurostat undertook to review their respective quality approaches in response to concerns expressed by Joint Member States about differences in the Data Quality Assessment Framework (DQAF July 2003) used by the IMF and the quality definition of Eurostat.

Goal

The goal of the review was to minimize differences and this was achieved through the following steps:

- identify aspects where the two approaches can be harmonized;
- integrate as many of these aspects into each of the two approaches;
- provide rationale of remaining differences; and
- explain how the two approaches relate to one another so that countries can make use of the two approaches.

Interested member states' support was sought during the exercise, and other international organizations were supportive of the exercise.[2]

Findings

The main finding is that IMF and Eurostat quality approaches are complementary:

- Both approaches promote countries' data quality, with the IMF framework[3] taking a holistic view of data quality compared to Eurostat's greater focus on statistical outputs;

- The IMF framework takes into account governance of statistical systems, core statistical processes, and statistical products. While focusing on the statistical outputs

[2] Draft versions of the report were presented to various committees: the Statistical Programming Committee of the European Union, 2002, the Sixth meeting of the Assessment of Quality in Statistics, October 2–3, 2003, the OECD/IMF Workshop *Assessing and Improving Statistical Quality* of November 5–7, 2003, and the IMF Balance of Payments Committee on December 8, 2003. The final version incorporates comments received.

3 The DQAF was initially prompted in part by a need to supplement the IMF Data Dissemination Standards (SDDS and GDDS) that focus primarily on the dissemination attributes of statistical outputs.

as viewed from the users, Eurostat works its way back to the underlying processes where the outputs do not yield a direct measurement;

- Six aspects of data quality were identified as common to the two approaches (and further harmonized as part of the reconciliation exercise): relevance, geographical comparability/methodological soundness, accuracy and reliability, consistency/ coherence, timeliness, and accessibility. This leaves the institutional and organizational aspects of data production, including assurance of integrity, that are covered by the IMF framework but not the Eurostat approach.

- The two approaches provide measures of quality that complement one another, with the IMF approach referring to qualitative measures of statistical practices and Eurostat focusing on quantitative aspects. In the broader IMF framework, statistical practices are presented as part of an integral system and this permits the evaluation of the trade-offs inherent to the statistical production. This framework could also usefully serve as setting to situate the Eurostat quantitative measures in their appropriate context, especially for quantitative measures that can give ambiguous messages. For instance, "low revision ratios" can reflect either reliable statistics that incorporate results of extensive revision studies, or estimates that do not incorporate new source data.

- The IMF DQAF provides quality benchmarks in the form of internationally accepted statistical practices against which national practices can be assessed in relative terms (Observed, Largely Observed, Largely Not Observed, Not Observed). Concerning the Eurostat approach, benchmark quality assessments are yet to be developed for the absolute quality measures (e.g., user satisfaction index, unit response rates).

- By bringing out the complementary nature of the two approaches, the comparison exercise successfully paves the way to pursue the quality work in common. It is expected that the joint development of a glossary of data quality terms (already underway) and other related initiatives will lead to a further convergence of the two approaches.

Plan

Part One of this document provides a summary review of the IMF quality framework and of Eurostat's definition of quality and reflects the modifications/clarifications undertaken as a result of the harmonization exercise. Part Two compares the two approaches. Part Three focuses on the commonalities of the two approaches highlighting the complementarity of the measures of quality. A concluding part summarizes and sets the way forward. An overview of the IMF Framework is provided in the Appendix.

PART ONE: THE TWO APPROACHES

IMF Data Quality Assessment Framework (DQAF)

1. The IMF DQAF views quality through a prism that covers governance of statistical systems, core statistical processes and observable features of the outputs. The framework is applicable to countries in all stages of development as it comprehensively covers the various quality aspects in which data are collected, processed, and disseminated. The DQAF is structured to be applicable to economic, demographic and social statistics. It addresses a broad range of questions that are captured through the ***prerequisites*** of quality and five ***dimensions*** of quality: assurances of integrity, methodological soundness, accuracy and reliability, serviceability, and accessibility.

Table 1. Quality Aspects Addressed by the IMF Framework

Key Questions	IMF DQAF
How is the quality of statistics affected by the legal and institutional environment and resources, and is there quality awareness in managing activities?	0. Prerequisites of quality
	Dimensions
What are the features that support firm adherence to objectivity in the production of statistics so as to maintain users' confidence?	1. Assurance of integrity
How do the current practices relate to the internationally agreed methodological practices for specific datasets?	2. Methodological soundness
Are the source data, statistical techniques, and supporting assessments and validation techniques, inclusive of revisions studies, adequate to portray the reality to be captured by specific datasets?	3. Accuracy and reliability
How are users' needs met in terms of timeliness of the statistical products, their frequency, consistency, and their revision cycle?	4. Serviceability
Are effective data and metadata easily available to data users, and is there assistance to users?	5. Accessibility

2. The DQAF addresses these questions through a framework that progresses from the abstract/general to the more concrete/specific details, using a cascading structure.[4] Each of the prerequisites and five dimensions is composed of ***elements*** (two-digit level) that further consist of ***indicators*** (three-digit level). These first three levels are common to all datasets, with two dimensions (methodological soundness as well as accuracy and reliability) specific to datasets (e.g., national accounts, balance of payments, government finance statistics, etc.). The indicators further divide among ***focal issues*** (fourth level) and ***key points*** (fifth level).

[4] Carson and Liuksila, 2001; Carson 2001.

3. The DQAF describes accepted good statistical practices, including internationally accepted methodologies, that assist in probing in a systematic manner the statistical practices of countries in producing a given dataset. These practices are rooted in the United Nations *Fundamental Principles of Official Statistic*s. Their identification is the outcome of an intensive consultation with national and international statistical authorities, and with data users, with the most recent round of consultation incorporating:

- the results of the current reconciliation exercise with Eurostat;
- methodological improvements made at the international and supranational (e.g., European Union guidelines) levels; and
- lessons learned from the good statistical practices of countries as a result of the IMF conducting 29 DQAF-based Reports on Observance of Codes and Standards (ROSCs) over the period.

4. The resulting DQAF, the July 2003 version,[5] includes refinements such as relevance identified as a prerequisite of quality, EU guidelines integrated in methodological soundness, survey techniques more clearly delineated, and more precision in statistical techniques (e.g., punctuality of data release).

Eurostat Approach

5. Eurostat's basic aim is to define quality of the output of official EU statistics. The starting point is the user and how he/she sees the product, and Eurostat works its way back to the underlying processes where the outputs do not yield a direct measurement.

6. In its previous form, data quality was made up of seven *dimensions*: relevance, accuracy, timeliness and punctuality, accessibility and clarity, comparability, coherence, and completeness. Further refinements resulting from the current reconciliation exercise include: completeness merged with relevance, comparability referring to cross country comparability, comparability over time or over datasets covered under coherence.

Table 2. Quality Aspects Addressed by the Eurostat Approach

Key questions	Eurostat data quality dimensions
Are the data what the user expects?	1. Relevance
Is the figure "reliable"?	2. Accuracy
Are the data in all necessary respects comparable across countries?	3. Comparability
Are the data coherent with other data?	4. Coherence
Does the user get the data in time and according to pre-established dates?	5. Timeliness and punctuality
Is the figure easily accessible and understandable?	6. Accessibility and clarity

[5] Available at the IMF Data Quality Reference Site http://dsbb.imf.org/Applications/web/dqrs/dqrswork/.

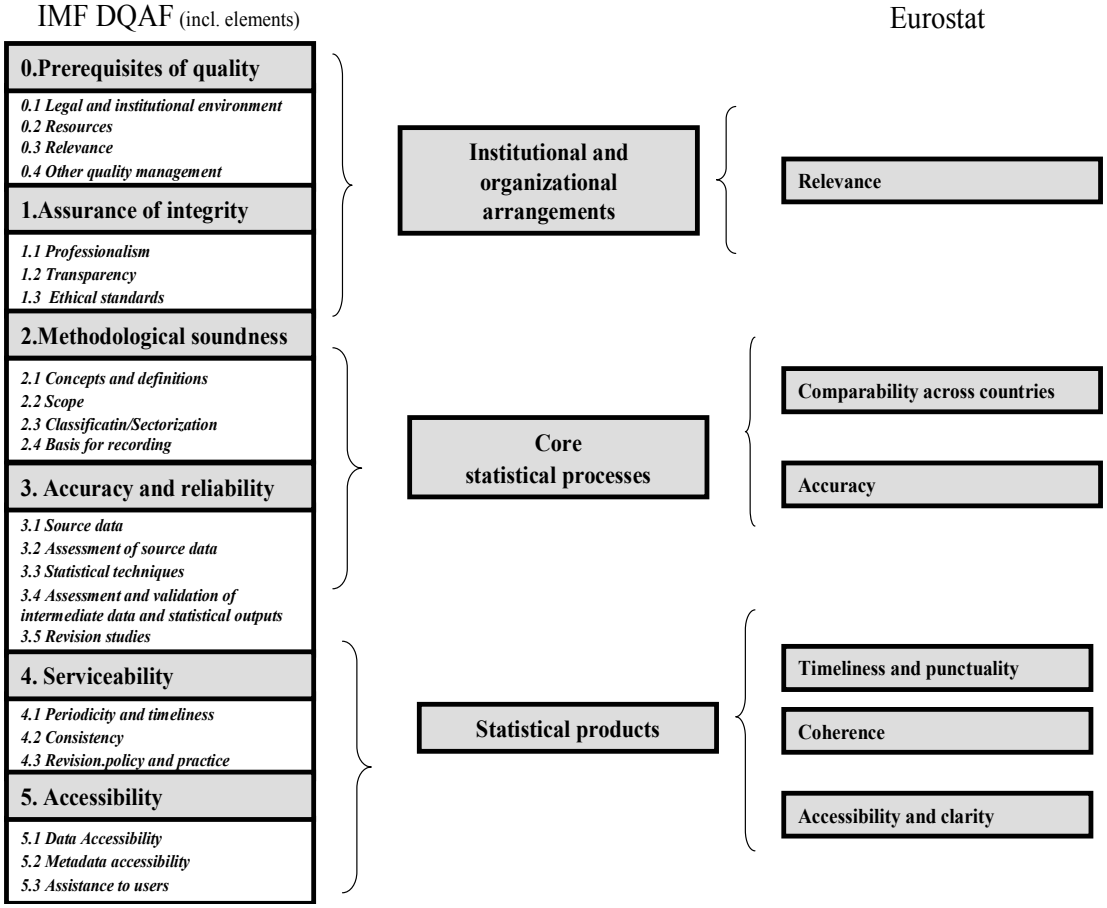
7. In order to answer these questions, features of the output (i.e., data) can be used directly such as directly measurable components of relevance, timeliness or punctuality. For other components, such as accuracy or comparability, background information coming from the underlying processes are necessary to consider. In these cases, not all aspects of the processes are considered but only those that are needed to describe the relevant aspect—leading to the effect that more general aspects such as financing, management and alike are not considered in this definition as they are less related to individual products and more to the system as a whole.

PART TWO: COMPARISON OF THE TWO APPROACHES

Overall comparison

8. The comparison was conducted by regrouping the dimensions and elements[6] of the two definitions under three broad common headings: Institutional and organizational arrangements, Core statistical processes, and Statistical products. This rearrangement highlights the IMF holistic approach and the Eurostat focus on products.

Comparison of IMF DQAF and Eurostat Quality Definition



[6] With dimensions and elements identified respectively with the following fonts: **Dimensions** and *Elements*.

Institutional and organizational arrangements

- **Prerequisites of quality** (IMF) and **Relevance** (Eurostat)

  IMF:
  Refers to institutional and organizational conditions that have an impact on data quality. The elements within the category refer to the *legal and institutional environment*, *resources*, *relevance* and *other quality management*. *Relevance* provides for two modes: internal processes to reach users, and users' feedback through survey and the like.

  Eurostat:
  Relevance focuses on the user's viewpoint, through users' identification, users' surveys and the like (but do not encompass internal processes, as does the IMF approach). No counterpart reference is made to *legal and institutional environment, resources* and *other quality management* though Eurostat recognizes that these elements can affect quality**.**

  The relevance element of the IMF **prerequisites of quality** *and Eurostat* **relevance** *dimensions are very close.*

- **Assurance of integrity** (IMF)

  IMF:
  Identifies features that support firm adherence to objectivity in the collection, compilation, and dissemination of statistics so as to maintain users' confidence. Elements refer to the *professionalism* and *ethical standards* in guiding policies and practices, which should be reinforced by their *transparency***.**

  Eurostat:
  No counterpart reference. Core elements are included in Council Regulation (EC) n° 322/97 of February 1997 on Community Statistics[7] and the Quality Declaration of the European Statistical System signed in September 2001 by its Statistical Programming Committee (Eurostat 2001) which covers some aspects of the IMF dimension **assurance of integrity**.

Except for *relevance* that is identified in both frameworks, the other elements of the IMF *Prerequisites of quality* are not covered in Eurostat's definition.

[7] Article 10 states that "Community statistics shall be governed by the principles of impartiality, reliability, relevance, cost-effectiveness, statistical confidentiality and transparency."

Core statistical processes

- **Methodological soundness** (IMF) and **comparability across countries** (Eurostat)

  IMF:
  a dimension that refers to the application of international standards, guidelines, and agreed practices to produce statistical outputs. Application of such standards fosters international comparability.

  Eurostat:
  Covered by the dimension **comparability** when it concerns the application of international definitions of concepts and classifications since some EU methodological guidelines are agreed upon in terms of classification and other conceptual aspects.

- **Accuracy and reliability** (IMF) and **accuracy** (Eurostat).

  IMF:
  Emphasis is on processes in place to ensure the quality of data sources, including information on sampling and nonsampling errors in data sources.

  Survey methodology is covered under the first level of statistical techniques; the second level of techniques pertains largely to "systems of accounts" (e.g., national accounts).

  Key importance is given to revision studies as a means to improve the coherence between provisional and final estimates (increased reliability).

  Eurostat:
  Emphasis is on errors in data sources and the measurement of such errors (as far as possible in quantitative terms). Measurement errors for "systems of accounts" remain to be identified (e.g., BOP Eurostat/ECB committee).

  Survey methodology is well covered with detailed breakdown provided for different aspects of sampling and nonsampling errors.

  Revision studies as a means to improve the statistical processes are not covered since the focus is to measure errors but should be covered in one way or the other.

Core statistical processes are composed of two dimensions in both the IMF and Eurostat frameworks. The IMF **methodological soundness** is shown under **comparability** in Eurostat. **Accuracy** is a dimension common to both frameworks. IMF **reliability**, as captured by revision studies, is not part of Eurostat.

Statistical products

9. Statistical products are measured by IMF serviceability and accessibility and by three Eurostat dimensions.

The three elements of IMF **serviceability** (*periodicity and timeliness, consistency, revision policy and practice*) correspond to two Eurostat dimensions (**timeliness and punctuality,** and **coherence**).

- *Periodicity and timeliness* - element of **serviceability** (IMF) and **timeliness** (Eurostat).

  IMF:
  Periodicity refers to the frequency of dissemination of the data. This element is not part of Eurostat, as it is viewed as a given (extraneous) in Eurostat's wide ranging set of products.

  Timeliness refers to the amount of time between the reference period and dissemination date. The IMF is considering to add "punctuality" (as per Eurostat) to show the amount of time between the pre-announced release date and the effective dissemination date.

  Eurostat:
  Timeliness refers to the amount of time between the reference period and the identified release date. The punctuality shows the amount of time between the identified release date and the effective dissemination date.

  The timeliness of the IMF **serviceability** *and Eurostat* **timeliness** *are very close**.** IMF would consider adding punctuality, as per Eurostat. Eurostat does not have periodicity.*

- *Consistency* - element of **serviceability** (IMF) and ex **coherence** (Eurostat).

  IMF:
  Consistency covers three levels: within the dataset, with other datasets, and over time.

  Eurostat:
  Coherence covers four levels: intra-annual and annual statistics, overtime, between different statistical domains (e.g. business and social statistics), and with national accounts.

  IMF consistency "within dataset" is covered in Eurostat "intra-annual and annual consistency."
  IMF consistency of "other datasets" is covered in Eurostat "statistical domains and national accounts."

IMF consistency "over time" is covered in Eurostat coherence.

- Revision policy and practice - element of **serviceability** (IMF)

  IMF:
  Refers to revisions following a regular and publicized pattern, with preliminary data clearly identified and revision studies made public.

  Eurostat:
  Informing users of revision policy and practice is not referred to, nor of making revision studies public, depending on the wide range of products (see above).

- **Accessibility** (IMF) and **accessibility and clarity** (Eurostat).

  IMF:
  Deals with the availability of information to users. Elements refers to *data accessibility* (presentation, dissemination media and formats, preannounced schedule, released simultaneously to all users, availability of non published details upon request); *metadata accessibility* (documentation available, with levels of details to meet various needs, contact person publicized, and catalogues, documents and other services widely available); and *assistance to users*.

  Eurostat:
  Accessibility deals with the conditions to access data: means, support, marketing conditions, possible restrictions, existing service-level agreements and alike. *Clarity* covers accompanying information on data (documentation, explanation, quality limits, etc.), assistance available to users and information on improvements compared to previous releases of data.

  The IMF data accessibility corresponds to Eurostat **accessibility** *and the IMF metadata accessibility* and *assistance to users to Eurostat* **clarity**.

The *statistical outputs* are measured by:
Serviceability (IMF) that is very close to three Eurostat dimensions (**timeliness and punctuality,** and **consistency**). **Accessibility**, a dimension that is common to both definitions.

PART THREE: COMMONALITIES OF THE TWO APPROACHES

Common aspects of quality

10. The above analysis proved very useful in identifying and further harmonizing the six main aspects of statistical production (see Table 3) that are common to the two approaches.

Table 3. Aspects of Quality Common to the Two Approaches

Order	Eurostat/IMF common quality aspects
1	Relevance
2	Geographical comparability/methodological soundness
3	Accuracy and reliability
4	Consistency/coherence
5	Timeliness
6	Accessibility

Measures of quality

11. The quality indicators used to measure the quality of each aspect are however specific to each approach. As shown in the table below, the IMF indicators are process oriented, as measured by the internationally accepted practices in the DQAF, whereas Eurostat focuses largely on output oriented indicators.

Table 4: Quality Measurement Indicators of the Two Approaches

Common aspects	DQAF Indicators (Process-oriented)	Eurostat Indicators (Output-oriented)
Relevance	0.3.1 The relevance and practical utility of existing statistics in meeting users' needs are monitored.	R1.User satisfaction index R2. Number of publications disseminated and/or accesses to databases CP1. Rate of available statistics
Geographical comparability/ methodological soundness	2.1.1 The overall structure in terms of concepts and definitions follows internationally accepted standards, guidelines, or good practices. 2.2.1 The scope is broadly consistent with internationally accepted standards, guidelines, or good practices. 2.3.1 Classification/ sectorization systems used are broadly consistent with internationally accepted standards, guidelines, or good practices. 2.4.1 Market prices are used to value flows and stocks. 2.4.2 Recording is done on an accrual basis. 2.4.3 Grossing/netting procedures are broadly consistent with internationally accepted standards, guidelines, or good practices.	C1. Number and proportion of differences in concepts or/and measurement from European norms C3. Asymmetries for statistics mirror flows

Common aspects	DQAF Indicators (Process-oriented)	Eurostat Indicators (Output-oriented)
Accuracy and reliability	3.1.1 Source data are obtained from comprehensive data collection programs that take into account country-specific conditions. 3.1.2 Source data are consistent with the definitions, scope, classifications, valuation, and time of recording required 3.1.3 Source data are timely. 3.2.1 Source data—including censuses, sample surveys and administrative records—are routinely assessed, e.g., for coverage, sample error, response error, and nonsampling error; the results of the assessments are monitored and guide statistical processes. 3.3.1 Data compilation employs sound statistical techniques to adjust data sources. 3.3.2 Other statistical procedures (e.g., data adjustments and transformations, and statistical analysis) employ sound statistical techniques. 3.4.1 Main intermediate data are validated against other information where applicable. 3.4.2 Statistical discrepancies in intermediate data are assessed and investigated. 3.4.3 Statistical discrepancies and other potential indicators of problems in statistical outputs are investigated. 3.5.1 Studies and analyses of revisions are carried out routinely and used to inform statistical processes.	A1. Coefficient of variation (CV) A2. Unit response rates A3. Item response rates A4. Editing rates and ratios A5. Imputation rates and ratios A6. Over-coverage and misclassification error rates A7. Average size of revisions
Coherence/ Consistency	4.2.1 Statistics are consistent within the dataset. 4.2.2 Statistics are consistent or reconcilable over a reasonable period of time. 4.2.3 Statistics are consistent or reconcilable with those obtained through other data sources and/or statistical frameworks.	CH1. Number and proportion of products that satisfies the requirements for the main secondary use C2. Number and length of comparable time series
Timeliness	4.1.1 Periodicity follows dissemination standards. 4.1.2 Timeliness follows dissemination standards.	T1. Punctuality of time schedule of effective publication T2. Average time between the end of reference period and the date of the first results T3. Average time between the end of reference period and the date of the final results

Common aspects	DQAF Indicators (Process-oriented)	Eurostat Indicators (Output-oriented)
Accessibility	5.1.1 Statistics are presented in a way that facilitates proper interpretation and meaningful comparisons (layout and clarity of text, tables, and charts). 5.1.2 Dissemination media and format are adequate. 5.1.3 Statistics are released on a preannounced schedule. 5.1.4 Statistics are made available to all users at the same time. 5.1.5 Statistics not routinely disseminated are made available upon request 5.2.1 Documentation on concepts, scope, classifications, basis of recording, data sources, and statistical techniques is available, and differences from internationally accepted standards, guidelines or good practices are annotated. 5.2.2 Levels of detail are adapted to the needs of the intended audience. 5.3.1 Contact person for each subject field is publicized. 5.3.2 Catalogs of publications, documents, and other services, including information on any charges, are widely available.	AC1. Number and types of means used for disseminating statistics

12. The IMF indicators illustrate or document the interdependence of quality aspects and take into account the various factors that are at play in influencing data quality. For instance, lack of data accuracy could be attributable to a low response rate in an isolated instance or the low response rate could be symptomatic of a more profound problem of ineffective statistical legislation. Conversely, the timeliness of a statistical output could be deceiving: if such data are compiled from data sources that are not timely, timeliness may be indicative of over reliance on statistical techniques. In other words, the IMF approach helps identify causes of deficiencies and the means for addressing these, taking into account the country-specific circumstances.

13. The idea of the Eurostat quality definition is to capture those aspects of statistical production that are subject to quantifiable measures, such as standardized statistical measures (e.g., measurement errors). A major advantage of such measures is to present findings where key elements can easily be aggregated.

14. The two approaches could usefully be used as complementary measures of data quality. The IMF approach presents statistical practices as part of an integral system and this permits the evaluation of the trade-offs inherent to the statistical production. This framework could also usefully serve to situate the Eurostat quantitative measures in their appropriate setting, especially for quantitative measures that can give ambiguous messages. For instance, “low revision ratios” can reflect reliable statistics that incorporate results of extensive revision studies, or estimates that failed to incorporate new source data.

Assessment of quality

15. So far, the assessment of quality has largely been performed by the IMF staff through the Report on the Observance on Standards and Codes. Using the DQAF as benchmark, the assessment is conducted using a four-part scale that ranges from "observed" to "not observed" by comparing national practices against internationally accepted practices.

16. The Eurostat quality definition is used by national statisticians to measure quality, with the focus on quantitative measurements. Benchmarks that would serve to assess these measurements remain to be developed.

CONCLUSIONS AND WAY FORWARD

17. The reconciliation exercise between the IMF and Eurostat quality approaches consisted in analyzing and comparing the quality aspects of the two approaches. This led to the identification and further harmonization of quality aspects that are common between the two approaches. The analysis brought out the complementarity of the quality measures: IMF focusing on process-oriented indicators and providing qualitative measurements; Eurostat focusing on output-oriented indicators and providing, to the extent possible, quantitative measures.

18. Both measures seek meaningful and empirically supported findings, one in qualitative terms the other in quantitative terms. Because they help to shed light on data production from different viewpoints, the two approaches complement each other. While the Eurostat definition measures the outcomes of selected statistical production processes, the DQAF helps also to clarify the processes that gave rise to such outcomes, thereby providing direction for action. Finally, the DQAF provides the benchmarks, the internationally accepted good practices, against which the national processes can be compared/assessed.

19. The reconciliation exercise paves the way forward for common work on data quality, with the development of a common glossary of terms currently underway. In the long run, it is expected that the two approaches will further converge as they both provide very useful insights in understanding the complexities of the statistical world.

IMF Data Quality Assessment Framework (July 2003)

0. Prerequisites of quality:

Although not itself a dimension of quality, this group of "pointers to quality" includes elements and indicators that have an overarching role as prerequisites, or institutional preconditions, for quality of statistics. Note that the focus is on the agency, such as a national statistical office, central bank, or a ministry/department. These prerequisites cover the following elements:

0.1 legal and institutional environment,
0.2 resources available for the statistical program,
0.3 relevance, and
0.4 other quality management.

1. Assurances of integrity:

This dimension relates to the adherence to the principle of objectivity in the collection, compilation, and dissemination of statistics. The dimension encompasses institutional arrangements that ensure professionalism in statistical policies and practices, transparency, and ethical standards. The three elements for this dimension of quality are the following:

1.1 professionalism,
1.2 transparency, and
1.3 ethical standards.

2. Methodological soundness:

This dimension covers the idea that the methodological basis for the production of statistics should be sound and that this can be attained by following internationally accepted standards, guidelines, or good practices. This dimension is necessarily dataset-specific, reflecting different methodologies for different datasets. This dimension has four elements, namely:

2.1 concepts and definitions,
2.2 scope,
2.3 classification/sectorization, and
2.4 basis for recording.

3. Accuracy and reliability:

This dimension covers the idea that statistical outputs sufficiently portray the reality of the economy. This dimension is also data specific, reflecting the sources used and their processing. The five elements of this dimension cover the following:

3.1 source data,
3.2 assessment of source data,
3.3 statistical techniques,
3.4 assessment and validation of intermediate data and statistical outputs, and
3.5 revision studies.

4. Serviceability:

This dimension relates to the need that statistics are disseminated with an appropriate periodicity in a timely fashion, are consistent internally and with other major datasets, and follow a regular revision policy. The three elements for this dimension are as follows:

4.1 periodicity and timeliness,
4.2 consistency, and
4.3 revision policy and practice.

5. Accessibility:

This dimension relates to the need for data and metadata to be presented in a clear and understandable manner on an easily available and impartial basis, that metadata are up-to-date and pertinent, and that a prompt and knowledgeable support service is available. This dimension has three elements, namely:

5.1 data accessibility,
5.2 metadata accessibility, and
5.3 assistance to users.

REFERENCE

Carson, Carol S., February 2001, "Toward a Framework for Assessing Data Quality," IMF Working Paper 01/25, (Washington: International Monetary Fund).

Carson, Carol S., and Claire Liuksila, "Further Steps Toward a Framework for Assessing Data Quality," International Conference on Quality in Official Statistics, Stockholm, Sweden, May 14–15, 2002.

Eurostat (2003), Standard Quality Indicators- producer-oriented, Document n° Eurostat/A4/ Quality/03/General/Standard Indicators.

Eurostat (2002a), Definition of Quality in Statistics, Document n° Eurostat/A4/ Quality/02/General/ Definition.

Eurostat (2002b), Standard Quality Report, Document n° Eurostat/A4/Quality/ 02/Standard/Report.

Eurostat (2002c), Glossary on Quality in Statistics, Document n° Eurostat/A4/Quality/ 02/Standard/Glossary.

Eurostat (2002d), How to make a quality report - version 1, Document n° Eurostat/A4/ Quality/02/General/How To Make a Quality Report.

Eurostat (2001), Summary Report from the Leadership Group (LEG) on Quality. Luxembourg, 31 July 2001.

Grünewald, W. and Linden, H. (2001), Quality measurement—Eurostat experiences, Symposium on Achieving Data Quality in a Statistical Agency. Statistics Canada, Ottawa, October 17–19, 2001.

Statistics Canada (2002), Statistics Canada's Quality Assurance Framework, Catalogue 12-586-XIE.