UNITED NATIONS
International Merchandise Trade Statistics

UNSD-SACU workshop
on the implementation of the new recommendations
for International Merchandise Trade Statistics (IMTS 2010)
in SACU Member States

12 – 15 June 2012, Johannesburg, South Africa

14 June - item 4:

Data quality and metadata

Presentation by Matthias Reister
Chief, International Merchandise Trade Statistics Section
Trade Statistics Branch, United Nations Statistics Division
E-mail: reister@un.org

Data quality (IMTS 2010 Chapter IX)

- **Newly added, previously covered in IMTS Compilers Manual**

Four parts

A. Enhancing quality of international merchandise trade statistics
B. Measuring quality of international merchandise trade statistics
C. Quality measures and indicators
D. Cross-country data comparability
E. Metadata

A. Enhancing quality

- Enhancing data quality is a process covering all stages of the statistical production process:
  - **starts with validation of the data provided by the trader or broker when completing the customs declaration,**
  - **requires appropriate institutional arrangements, for example, in order to allow adequate access to different data sources and**
  - **implies the appropriate use of information and communication technology among many other relevant activities.**

A. Enhancing quality

- Systematic approach to data quality:

  ⇨ **implies that all aspects of the entire trade statistics program are examined and evaluated against certain principles and standards**

  (which allows to more effectively identify and implement appropriate actions to further improve data quality)

  ⇨ **It is recommended that countries develop such standards and related good practices covering the institutional arrangements, the statistical processes and outputs**

  ➔ ***Actions for enhancing data quality are often focused on individual elements of the data such as reported commodity, value, quantity, quantity unit and trading partner etc. but must also address more general issues of coverage and comprehensiveness of recording.***

A. Enhancing quality

- Quality reporting:

⇨ **Further, it is recommended that countries develop a standard for regular quality reports**

⇨ **which cover the full range of statistical processes and their outputs and which would use the above mentioned principles and standards as its basis.**

⇨ **Such reports can be either producer-oriented with the aim to identify strengths and weaknesses of the statistical process and lead to or contain the definition of quality improvement actions or user-oriented with the aim to keep users informed on the methodology of the statistical process and the quality of the statistical output.**

⇨ **It is recommended that the quality reports on IMTS should be completed or updated at least every five years or more frequently.**

⇨ **It is recommended that countries base their quality reports on a set of quantitative and qualitative indicators for IMTS and on a checklist covering data collection, processing and dissemination to allow for an assessment of strengths and weaknesses in the statistical process and to identify possible quality improvement actions.**

B. Measuring quality of IMTS

- Data quality assessment frameworks:

⇨ **Most international organizations and many countries have developed definitions of quality, outlining the various dimensions (aspects) of quality and quality measurement, and integrated them into quality assessment frameworks**

⇨ Examples:

- **The *IMF Data Quality Assessment Framework (DQAF)* takes a holistic view of data quality and includes governance of statistical systems, core statistical processes and statistical products.**
- **The *European Statistical System (ESS)* adopted a Code of Practice which provides a broad conceptual framework for viewing quality and sets standards for the institutional environment, statistical processes and statistical outputs.**
- **The *OECD quality measurement framework* views quality as a multifaceted concept.** Quality is viewed in terms of seven dimensions: relevance, accuracy, credibility, timeliness, accessibility, interpretability and coherence.

B. Measuring quality of IMTS

- Data quality assessment frameworks:

  ⇨ The overall aim of the three quality assessment frameworks is to standardize and systematize statistical quality measurement and reporting across countries.

  ⇨ The quality assessment frameworks could be used in a number of contexts, including for

  (a) guiding countries' efforts towards strengthening their statistical systems by providing a self-assessment tool and a means of identifying areas for improvement;

  (b) technical assistance purposes;

  (c) reviews of particular statistical domains as performed by international organizations; and

  (d) assessment by other groups of data users.

B. Measuring quality of IMTS

- Dimensions of quality
  - Countries should implement one of the existing frameworks for quality assessment or develop on their basis national quality assessment frameworks that fit best their country's practices and circumstances.
  - **It is recommended** that the following dimensions of quality are taken into account while developing such frameworks:
    1. ***Prerequisites of quality***
    2. ***Relevance*** **(degree to which they meet the user needs)**
    3. ***Credibility*** **(confidence that users place in those statistics)**
    4. ***Accuracy***
    5. ***Timeliness***
    6. ***Methodological soundness***
    7. ***Coherence***
    8. ***Accessibility***

C. Quality measures and indicators

- **countries are encouraged** to use a system of quality measures/indicators as a single quantitative measure of quality is not possible
- in practice, quality measures can be difficult or costly to calculate. Instead, quality indicators can be used in the quality assessment.
- When countries define the quality indicators for their international merchandise trade statistics, **it is recommended** that the indicators satisfy the following criteria:
  - a) they cover all dimensions of quality
  - b) are based on the consistent application of a sound methodology; and
  - c) the indicators are easy to interpret both by internal and external users.
- **It is recommended** that countries maintain a balance between different dimensions of quality and the number of indicators

C. Quality measures and indicators

Table 9.1: Suggested indicators for measuring the quality of international merchandise trade statistics

Quality dimension	*Quality measure/indicator*
Relevance	1. Gaps between key user interests and compiled international, merchandise trade statistics in terms of concepts, coverage and detail 2. Results of users' satisfaction surveys and meetings with user groups.
Accuracy	1. Application of reporting thresholds, 2. Under-coverage (% of non-reporting due to thresholds, % of non-reporting due to non-response), 3. Characteristics and frequency of revisions (e.g. as % of total value), 4. Application of confidentiality and its impact, 5. Use of data validation techniques and their impact. In the case of sample surveys-based international merchandise trade estimates, the accuracy can be measured using the following indicators: 6. Sampling errors 7. Non-sampling errors - Unit response rate - Item response rate

D. Cross-country data comparability

- Non-comparability is caused, inter alia, by differences in coverage; different methods for the treatment of certain goods (e.g. military goods, ship's stores, confidential data); value increases in intermediary countries; differences in classification of goods; time lags in reporting etc.
- Such non-comparability may be substantially reduced by the adoption of the concepts and definitions recommended in the present publication.
- Nevertheless, a certain amount of non-comparability will remain.
- **Countries are encouraged,** therefore, to periodically conduct bilateral and multilateral reconciliation studies or implement data exchanges so that their statistics can be made more accurate and useful both for national purposes and for international comparisons. (end)

E. Metadata on international merchandise trade statistics

- The term "**metadata"** defines all information used to describe other data. A very short definition of metadata, then, is "data about data." Metadata encompasses administrative facts about data (who has created them and when), definition of concepts applied as well as description of how data were collected and processed before they were disseminated or stored in a database
- Metadata facilitate sharing, querying and understanding of statistical data over the lifetime of the data.
- **The relationship between metadata and quality**. On the one hand, metadata describe the quality of statistics. On the other hand, metadata are themselves a quality component, which improves the availability and accessibility of statistical data.

E. Metadata on international merchandise trade statistics

As a minimum segmentation, metadata at the following two levels are **recommended**:

a) *Reference metadata* presented as a detailed explanatory note describing the scope, coverage and quality of a data set and is made available electronically alongside the database or in special publications;

b) *Structural metadata* presented as an integral part of the international merchandise trade statistics database and which can be extracted together with any data item; structural metadata can be published as part of a statistical table.

E. Metadata on international merchandise trade statistics

It is recommended that countries at least cover the following categories of metadata for their international merchandise trade statistics:

a) description of all underlying concepts and definitions, including the trade system used, and deviations from international standards, if any;

b) legal framework, institutional arrangements and description of data sources;

c) description of data collection and data processing procedures;

d) description of estimation methods;

e) data dissemination policy including release and revision schedules;

f) description of the all data fields/ variables (reference period, trade flow, commodity classification used, valuation, currency, quantity (net weight), weight unit used, supplementary quantity, supplementary quantity unit used, partner country (origin, last known destination, consignment) (this applies to all forms of data dissemination);

g) explanations and footnotes concerning the data as required, i.e. informing about revisions, break in series and application of confidentiality;

h) quality reporting.

E. Metadata on international merchandise trade statistics

- It is recommended that countries view the development of metadata as a high priority and consider their dissemination an integral part of the dissemination of international merchandise trade statistics.
- Moreover, it is recommended that this is done in compliance with the approach adopted by a given country to metadata across all areas of economic statistics.
- Countries are encouraged to take advantage of the metadata standards proposed by various international organizations while developing their metadata in general and trade metadata in particular.
- Further guidance on metadata for purposes related to international merchandise trade statistics will be elaborated and presented in the updated version of the IMTS Compilers Manual.

Additional guidance in IMTS 2010 – CM: Ch 9:
Data quality: assurance, measurement and reporting

A. Quality assurance
   1. An overview of the main elements of national quality assurance frameworks
   2. Quality assurance at customs
   3. Quality assurance at the responsible agency
   4. Major quality issues and how to approach them
   5. Country examples and best practices

B. Quality measurement and reporting
   1. Steps and guidelines for producing data quality reports
   2. User-oriented quality reports – contents and examples
   3. Producer-oriented quality reports – contents and examples
   4. Measuring data quality

C. Reconciliation studies, cross-country comparability and bilateral data exchanges

D. Inter-agency collaboration on data quality

Additional guidance in IMTS 2010 – CM: Ch 9: Data quality: assurance, measurement and reporting

Annex 9.1: Brazilian statistical depuration system

1. Preventive depuration
2. Continuous depuration
3. Post depuration

Annex 9.2: ASYCUDA Data quality assurance, measurement and reporting – Controls and reports

1. Existence controls
2. Data Format controls
3. Referential and validity controls
4. Consistency controls
5. ASYCUDA statistical reports

Annex 9.3: Detailed discussion of data items that affect statistical discrepancies between countries and further guidance

Annex 9.4: Experience of Brazil

Additional guidance in IMTS 2010 – CM: Chapter 9: Metadata

A. Basic concepts

B. Presentation and dissemination of metadata

C. Metadata items relevant for international merchandise trade statistics

D. Country practices

Thank you for your attention!