UNSD-ECLAC Workshop on International Trade Statistics

Implementation of IMTS 2010 and a new vision for trade statistics

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Item 18:
Data quality and metadata

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IMTS 2010, Chapter IX: Data quality and metadata

- *This is a newly added topic, previously covered in IMTS Compilers Manual*

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

A. Enhancing quality

- Covers all stages of the statistical production process (para. 9.3):
  - Starts with validation of data provided by trader or broker when completing customs declaration
  - Requires appropriate institutional arrangements (e.g., to allow adequate access to different data sources)
  - Implies appropriate use of information and communication technology, among many other relevant activities

A. Enhancing quality

- Systematic approach to data quality (para. 9.4):
  - Implies that all aspects of the 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, trading partner, etc.*
- *However, they 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. Reports can be (para. 9.5):
    - Producer-oriented - to identify strengths and weaknesses of the statistical process and lead to or contain the definition of quality improvement actions, or
    - User-oriented - 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. (para. 9.6)
  - 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. (para 9.7)

B. Measuring quality of IMTS

- Data quality assessment frameworks (para 9.8):
  - 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:
    a) 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.
    b) 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.
    c) The OECD quality measurement framework views quality as a multifaceted concept [with] seven dimensions: relevance, accuracy, credibility, timeliness, accessibility, interpretability and coherence.

B. Measuring quality of IMTS

- Data quality assessment frameworks (para 9.9):
  - 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:
    - ✓ Guiding countries' efforts towards strengthening their statistical systems by providing a ***self-assessment*** tool and a means of identifying areas for improvement;
    - ✓ ***Technical assistance*** purposes;
    - ✓ Reviews of particular statistical domains as performed by ***international organizations***; and
    - ✓ Assessment by other groups of ***data users***

B. Measuring quality of IMTS

- Dimensions of quality (para 9.10)
  - 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:
    a) Prerequisites of quality
    b) Relevance (degree to which they meet the user needs)
    c) Credibility (confidence that users place in those statistics)
    d) Accuracy
    e) Timeliness
    f) Methodological soundness
    g) Coherence
    h) Accessibility

C. Quality measures and indicators

- Countries are **encouraged** to use a system of quality measures and indicators, as deriving a single quantitative measure of quality is not possible (para. 9.13)
- Quality measures vs. quality indicators:
  - ***Quality measures*** directly reflect a particular aspect of quality, and can be difficult or costly to calculate
  - ***Quality indicators*** provide summarized evidence about the quality of the data
- When countries define the quality indicators for their IMTS, it is **recommended** that they satisfy the following criteria (para. 9.15):
  a) They cover all dimensions of quality
  b) They are based on the consistent application of a sound methodology
  c) They 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 (para 9.16)

C. Quality measures and indicators

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

Quality dimension	Quality measure and 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. Undercoverage (percentage of non-reporting due to thresholds, percentage of non-reporting due to non-response). 3. Characteristics and frequency of revisions (e.g., as percentage 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: (*a*) Unit response rate; (*b*) Item response rate. 8. Number and average size of revisions of international merchandise trade data.

D. Cross-country data comparability

- ***Causes of non-comparability of data across countries:***
  - 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 ***IMTS 2010***
- 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 (para. 9.18)

Additional guidance in IMTS 2010 - CM

Chapter 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

Chapter 9: Data Quality – Assurance, measurement and reporting

Annex 9.1: Brazilian statistical data validation system (exports example)

1. Preventive validation
2. Continuous and post validation

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: Conduct of reconciliation studies – the experience of Brazil

E. Metadata on IMTS

- The term "***metadata***" defines all information used to describe other data ("data about data")
- Metadata encompasses:
  - administrative facts about data (who has created them and when)
  - definition of concepts applied
  - 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.
- ***Relationship between metadata and quality.***
  - Metadata describe the quality of statistics.
  - Metadata are themselves a quality component, which improves the availability and accessibility of statistical data.

E. Metadata on IMTS

- 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 IMTS

- It is **recommended** that countries at least cover the following categories of metadata for their international merchandise trade statistics (para 9.23):
  - a) Description of all ***underlying concepts and definitions***, including the trade system used, and deviations from international standards, if any;
  - b) The ***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, e.g., about revisions, break in series and application of confidentiality;
  - ***h)*** ***Quality reporting***.

E. Metadata on IMTS

- 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

Additional guidance in IMTS 2010 - CM

Chapter 25: 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