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**OECD-EUROSTAT MEETING OF EXPERTS IN
TRADE IN SERVICES STATISTICS**

12 - 14 September 2006

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**Balance of Payments Quality Report:
Standards and Content**

Item 21e)

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1. INTRODUCTION

In accordance with the Regulation (EC) N°184/2005 of the European Parliament and of the Council on Community statistics concerning balance of payments, international trade in services and foreign direct investment, Member States shall supply Eurostat with an annual report on the quality of their BoP data transmitted to Eurostat.

After extensive consultations with all Member States and other Commission services an agreement has been achieved on the quality standards to be applied, definition of quality indicators, periodicity of quality report, assessment procedure and dissemination policy concerning the quality reports. The overall objective of quality reporting by Member States is to allow Eurostat to monitor the quality of the data Member States transmit to Eurostat. Based on this assessment, priority issues can be identified to further improve the quality of national balance of payments data.

In November 2006 the Member States will send for the first time the quality reports to Eurostat. The first year will be treated as a pilot phase. Lessons learned and experience gained during this pilot phase will be used to fine-tune the standards, contents and the assessment procedure and formalise the procedure by adopting corresponding Commission Regulation.

In line with the provisions of the BoP Regulation, the focus of the quality reports will be on "output quality", i.e. on the quality of data transmitted by the Member States to Eurostat. Four components of quality have been identified as relevant:

- methodological soundness,
- stability,
- plausibility and
- consistency.

The component "accuracy", though conceptually relevant, will be treated separately, in general qualitative terms, as a side-component, as it is related to quality on the input-side. Therefore, this component will not be taken into account for the overall assessment by Eurostat.

In line with current practice in other areas, the burden of generating the quality reports will be shared between Eurostat and the Member States. Whereas the former will provide the results of the quantitative indicators for each Member States, the latter will be invited to interpret and comment them, in light of their (changes in) collection systems.

2. QUALITY REPORTING: CONTENTS

This section presents the 5 quality components and the way they will be assessed in the annual quality reports.

2.1 Methodological soundness

Methodological soundness refers to the **compliance with internationally accepted standards, guidelines and good practices** (e.g. BMP5, MSITS, TF FDI etc.).

It is proposed to restrict this component to limited number of (mainly "yes/no") questions in the area of methodology, with a focus on compliance to internationally agreed standards. The

questions will relate to the current, capital and financial account of the BoP and FDI positions.

Apart from a short list of questions, Member States will be invited to describe the major methodological changes which have taken place during the reference period and how they affect the data quality.

2.2 Stability

Stability refers to the **closeness of the initial estimated value to the final value**. In practice, this consists of examining revisions (e.g. size and direction) between two defined sets of published data.

The assessment of stability is relevant in two contexts. First it is important Eurostat is informed of large revisions in the data transmitted by Member States. This helps Eurostat during the initial data validation process, before they are aggregated on EU level. Furthermore, this information will also contribute to explain possible large revisions in the EU aggregates.

Although revisions may take place for a number of reasons, they are primarily driven by the arrival of additional source data. Typically, a core set of source data are available for the first estimates that are released. Then, as more detailed and comprehensive source data arrive, the first estimates are revised to improve the accuracy of the statistics. Consequently, the first estimates will play a key-role in the assessment of stability.

Before entering into the quantitative assessment of revisions (size and direction) in the annual quality report, Member States will be invited to provide with further insight in the sources and methods used to prepare the initial estimates.

2.2.1 Description of national estimation methods

When transmitting the **first assessment** of quarterly or annual data to Eurostat, part of these statistics are collected from the final respondents and another part is estimated because some source data are not yet available. In this paragraph, Member States are invited to describe the first assessment with regards to:

- which BoP/FDI position items are estimated;
- using which estimation method;
- which is the final source for data collection;
- when this final information will be included in the final assessment.

The "first" assessments correspond to the delays specified in the BoP Regulation. Member States will be invited to describe the estimation methods for quarterly BoP, annual services and annual FDI flow and position data. This more *descriptive* part of stability will serve as methodological background information for the quantitative analysis, presented below.

2.2.2 Quantitative analysis

The size and direction of revisions directly impact the data quality as perceived by the end-users. A set of quantitative indicators has been defined for this analysis. It is important to note that, although quantitative indicators facilitate cross-country and inter-temporal comparisons,

their interpretation is not always straightforward: whereas large revisions obviously reduce the reliability of early estimates, small revisions do not necessarily imply high quality as they may point to a failure to incorporate new information when it becomes available. This underlines the importance of Member States providing adequate background information to the results of the quantitative indicators.

It is important to note that the indicators presented below only focus on the **very first and the last available estimates**¹. The quantitative analysis, as defined now, does not take into account intermediate estimates. In the future, it may be considered to include a study on the **path of revisions**, i.e. how fast a stable final estimate is reached, or, similarly, what is the lifetime of early (relatively inaccurate) estimates.

a) Assessing the size of revisions

The simple calculation of revisions expressed as absolute changes in original units hampers comparability across time and between countries, as these changes depend on the magnitude of the variable. Therefore, it is useful to provide a relative measure, which relates the revision to some dimensional measure of the variable. A distinction is made between the assessment of gross and net data.

In the case of **gross data** (data which express positive quantities, for example “total current account credits”), it is straightforward to devise a relative measure of revisions expressed in terms of percentage difference from the initial assessment, which is called the *percentage error*. As the gross data are time series, an average can be taken across time, hence calculating a mean percentage error. As revisions can be positive or negative, they will be taken in absolute value, in order to avoid a situation whereby revisions of opposite sign cancel each other in the results of the indicator. The expression becomes the **Mean Absolute Percentage Error (MAPE)**:

$$MAPE = \frac{1}{N} \sum_{t=1}^N \left| \frac{X_f^t - X_i^t}{X_i^t} \right| \quad (1)$$

Where,

X_i^t = the initial estimate for BoP item X in reference quarter t

X_f^t = the final (last available) estimate for the same BoP item in reference quarter t

N = the time frame

The outcome of MAPE, when multiplied by 100, presents the average percentage difference between initial and final estimates (comprised between 0 and infinity). The higher the value, the higher is the average size of revisions. If the result equals zero, there are no differences between the first and final estimates.

¹ The concepts “first” and “last available” estimate refer to the moment in time when the datasets were transmitted to Eurostat, as these are the datasets based on which Eurostat calculates the EU-aggregates. This does not necessarily coincide with the first or last estimate available within each Member State.

This analysis will be applied to the following BoP current account items (debits and credits): total current account, goods, services, transport, travel, other services, income and current transfers. Partner is “extra-EU25”.

In the case of **net data** (being either negative, zero or positive) the MAPE indicator cannot be used because of the risk of dividing by values equal or close to zero. Instead, the use of simple graphical representations is suggested as a basis for analysis.

It is proposed to apply this analysis on the following items: net inward/outward FDI flows, portfolio investment net assets and net liabilities flows, other investment net assets and net liabilities flows and net inward and net outward FDI positions; all with partner “extra EU25”, except for PI net liabilities, for which partner “World” will be used².

b) Assessing the direction of revisions

Over time, one expects to find both positive and negative revisions. If the revisions are systematically positive or negative, it will be necessary to analyse the underlying reasons for this, e.g. a lack of coverage in early estimates, and BoP compilers should attempt to correct this systematic bias. This simple indicator (called “UR”) is the ratio of *upward revisions* with respect to the number of observations (N).

$UR = (\# \text{ upward revisions}) / N \tag{2}$
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It is proposed to perform this analysis on all previously mentioned gross and net BoP items, except for FDI, for which too little observations are available (annual data).

c) Reliability of trends

Finally, it is also essential that the first estimate for a given period (X_i) provides a correct indication of the trend in the time series. That is, if the first estimate indicates an upward trend with respect to the previous quarter, one may reasonably expect this trend to be confirmed as soon as revised data are available. This analysis is based on a 2x2 contingency table of which the columns indicate the trend according to the initial estimate and the rows indicate the trend according to the final estimate.

		Trend according to initial estimate		Subtotal
		Negative $(X_i^t - X_f^{t-1}) < 0$	Positive $(X_i^t - X_f^{t-1}) > 0$	
Trend according to latest estimate	Negative $(X_f^t - X_f^{t-1}) < 0$	n ₁₁	n ₁₂	n ₁₁ +n ₁₂
	Positive $(X_f^t - X_f^{t-1}) > 0$	n ₂₁	n ₂₂	n ₂₁ +n ₂₂
Subtotal		n ₁₁ +n ₂₁	n ₁₂ +n ₂₂	N

Where:

X_i^t = the initial estimate for BoP item X in reference quarter t

² Partner “extra-EU25” for PI net liabilities is not requested in the BoP Regulation.

X_f^t = the final (last available) estimate for the same BoP item in reference quarter t

The *directional reliability* indicator is built as follows:

$$Q = \frac{n_{11} + n_{22}}{N} \quad (3)$$

The value coefficient Q is comprised between 0 and 1. It is equal to 1 when the trend predicted by the first estimate is always confirmed by the last available estimate (i.e., $n_{11} + n_{22} = N$), while if it is equal to 0, there is a total dissociation ($n_{11} + n_{22} = 0$). High values reflect a high directional reliability.

2.3 Plausibility

Plausibility refers to the **absence of unexplained changes**. As sudden changes in data patterns are of high analytical interest to end-users of statistical data (policy-makers, academics etc.) it is crucial to know whether they are caused by underlying economic trends or whether they are simply the result of methodological changes.

In the short term, it is important Eurostat is informed of the existence of significant outliers in the datasets transmitted by Member States. Similar to the explanations on large revisions, this additional information would help Eurostat during the initial data validation process, before the MSs' contributions are aggregated on EU level.

Secondly, from a more long-term perspective, it is also relevant to assess the *internal control procedures*, both on micro (i.e. individual reporter basis) and macro-level (aggregates), which are deployed by Member States for detecting and correcting outliers, especially when there is no economic or methodological reason for them. This information should be provided in the annual Quality Report. In particular, Member States are invited to evaluate their internal control procedures (strengths, weaknesses) and to describe further plans for improvement.

2.4 Consistency

Consistency analyzes the **coherence both within the dataset** (internal consistency) **and with other datasets** (external consistency).

2.4.1 Internal consistency

Internal consistency will be measured based on the “Errors and Omissions” and the “Unallocated Services” item.

a) Errors and Omissions (EO)

One expects EO to be relatively small and not persistently positive or negative in the long run. Three indicators are proposed, two measuring the size and one the direction of revisions.

Concerning the size of EO, a first indicator is the *Average Absolute Error*, AAE(EO):

$$AAE(EO) = \frac{1}{N} \cdot \sum_{t=1}^N |EO_t| \quad (4)$$

Where,

EO_t = Errors and omissions in reference quarter t, with respect to partner World

N = time frame

Whereas the Average Absolute Error depicts the trend in average size of the EO item, it gives no indication of its relative importance with respect to the size of the economy or the total value of international transactions. Therefore, a complementary indicator is used, the **Average Relative Error** ARE(EO), which relates the absolute EO item to the current receipts and expenditures :

$$ARE(EO) = \frac{1}{N} \cdot \sum_{t=1}^N \left| \frac{EO_t}{(CA(c)_t + CA(d)_t) / 2} \right| \quad (5)$$

Where,

EO_t = Errors and omissions in reference quarter t

N = time frame

$CA(c)_t$ = current account credits in reference quarter t

$CA(d)_t$ = current account debits in reference quarter t

However, similar to the analysis of the size of revisions, one should be careful with the interpretation of the results: whereas consistently large or sharply increasing E&Os are clearly undesirable, small E&Os do not necessarily reflect high data consistency as errors on debits and credits may cancel each other out. Therefore, MS are invited to complement the quantitative data with a short analysis of the observed trends.

Not only the size, also the sign of the E&O item matters; in the long run, an equal amount of positive and negative values is expected.

The use the following indicator is proposed: **Count positive E&O**, CP(EO):

$$CP(EO) = \frac{\text{count}(EO_t > 0)}{N} \quad (6)$$

Where,

EO_t = Errors and omissions in reference quarter t

N = time frame

b) Unallocated Service (US)

A second indicator in the area of internal consistency is the relative size of “**Unallocated Services**” with respect to “total services”. The larger this share, the lower the internal consistency of the services breakdown. The following simple indicator is proposed: **Absolute Relative share of Unallocated Services**, AR(US). It calculates the share of “unallocated services” within the total services. The quantitative data will be provided by Eurostat; the Member States are invited to make a description of the underlying trends.

$$AR(US) = \frac{1}{N} \sum_{t=1}^N \left(\frac{US_t}{(total_serv.)_t} \right) \tag{7}$$

Where,

US_t = total “Unallocated services” summing debits and credits for reference quarter t

$(Total_serv.)_t$ = total services summing debits and credits for reference quarter t

N = time frame

2.4.2 External consistency

External consistency reflects that statistics are reconcilable with those obtained through other data sources or statistical frameworks.

A good indicator for external consistency is the relation between, on the one hand, goods credits and debits from BoP statistics and, on the other hand, exports and imports from the foreign trade statistics (FTS). Given the fact that both statistics are calculated according to different methodologies, it is logical to find certain discrepancies between both series. As such, a simple study of differences between both series will not always prove revealing. Yet, from an end-user point of view, it is not sufficient to be pointed to methodological differences only; end-users expect at least the trends of both series to be identical.

The following two assessment methods are proposed: the reconciliation table and the directional consistency indicator.

a) The Reconciliation Table

A recognised tool for assessing consistency between BoP and FTS is the **Reconciliation Table**. A new Task Force Reconciliation between Balance of Payments and Foreign Trade Statistics has been created with the objective of analysing the reconciliation tables already compiled by some countries and defining a common standard table which could be included in the Quality Report.

b) Directional consistency

It is also relevant to check the **directional consistency** between both series, i.e. when goods exports in FTS rise, one also expects goods credits in the BoP series to rise. A tool which can provide this consistency check is a 2x2 contingency table. In this table the columns mark the trend in FTS, as registered by Eurostat, and the rows the trend in BoP:

		Trend according to f.t.s.		Subtotal
		Negative ($X^t - X^{t-1}$) < 0	Positive ($X^t - X^{t-1}$) > 0	
Trend according to b.o.p.	Negative ($X^t - X^{t-1}$) < 0	n ₁₁	n ₁₂	n ₁₁ +n ₁₂
	Positive ($X^t - X^{t-1}$) > 0	n ₂₁	n ₂₂	n ₂₁ +n ₂₂
Subtotal		n ₁₁ +n ₂₁	n ₁₂ +n ₂₂	N

For maximum directional consistency, one should expect a high sum for the leading diagonal (n₁₁+ n₂₂). The **directional consistency** indicator (Q_C) is then built as follows:

$$Q_c = \frac{n_{11} + n_{22}}{N} \quad (7)$$

This coefficient Q_c , comprised between 0 and 1, is equal to 1 when the changes in the BoP series and the changes in the external trade statistics follow the same pattern ($n_{11} + n_{22} = N$); it is equal to 0 when there is a total dissociation ($n_{11} + n_{22} = 0$).

2.5 Accuracy

Accuracy refers to the **closeness of the (final) estimate to the true population value**. However, this is difficult to measure as it supposes knowledge on the true underlying value.

The "accuracy" component of quality is intrinsically linked to the collection method and the data sources used. Given that according to the BoP Regulation, Member States can use all the sources they consider relevant, "accuracy" will only be treated in general terms, to the amount it contributes to the output quality. For this reason, Eurostat will not make any judgment on this component in its assessment of the 25 national quality reports.

Member States are invited to make a self assessment of the main challenges in their collection system(s) based on one or more of the following **parameters** (not exhaustive):

- For survey-based collection systems
 - How do you assure a sufficient geographical breakdown when selecting the samples?
 - On which sources do you rely to create a business register? With which frequency and time-lag are they updated?
 - What is the population coverage (per institutional sector) and the rate of non or late response?
 - How do you assure appropriate coverage of households?
- For ITRS-based collection systems
 - How do you assure coverage of all required transactions (including those involving no cash transfers or those transactions executed via non-resident banks)?
 - How do you estimate the transactions below the €12500 threshold? If you use keys, how frequently do you assess the validity of the keys?
 - How to assure consistency between stock and flow data for Foreign Direct Investment?
- For mixed collection systems
 - Combination of the above questions

3. ASSESSMENT PROCEDURE

Following the reception of the 25 Member States' quality reports, Eurostat will thoroughly analyse them, evaluate the content and prepare an **Assessment Report** for each Member State, containing:

- a statement on the completeness of the Quality Report;
- an evaluation of the quality criteria;
- a summary of the priority issues identified;
- eventually further requests for clarification;
- a set of recommendations for further improvements concerning the quality indicators.

In addition to the individual assessment reports for each Member State, Eurostat will also prepare a document, which will summarise all 25 assessment reports. This **Summary Assessment Report** will put together the main findings concerning the quality of output data sent by Member States to Eurostat in compliance with the regulation. The report will illustrate the state of play using summary statistics like mean, standard deviation, percentage, counts, etc. In addition to the summary tables for the Member States the report will also include statements concerning EU aggregates.

4. TIMELINE FOR THE FIRST ROUND OF QUALITY REPORTS

Member States shall submit the annual Quality Reports to Eurostat by **end-November 2006**. The choice of November is motivated by the fact that by then, a complete dataset is available on initial and revised values for the quarterly BoP of the previous year; as to the FDI position data, a revised dataset will be available for “reference year – 2” on the items “net direct investment abroad and in the reporting economy”.

One month in advance, i.e. **end-October 2006**, Eurostat will supply the Member States with the Quality Reports, pre-filled with most quantitative indicators and other information available.

Based on the 25 national Quality Reports, Eurostat will prepare the Assessment Reports for each Member State and the summary assessment report by **January 2007**.

5. DISSEMINATION POLICY

In order to allow a discussion in the Eurostat Balance of Payments Committee on the 25 **annual Quality Reports** and their respective assessments by Eurostat, Eurostat will make them available to the members of the BoP Committee only. Member States are of course free to decide whether or not to publish their individual reports on their website. The **Summary Assessment Report** will be published in Eurostat website and thus made available to general public. It will also be sent to the European Parliament for information.