**Quality indicators and quality measurement to foster and enhance cooperation between users and producers**

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**1 INTRODUCTION**

One of the main purposes of the Statistics Department of the Banco de Portugal is to ensure the production of high quality statistics aiming at fully meeting users’ needs. With this purpose, the Statistics Department developed quality manuals addressed to users of Banco de Portugal’ statistics to promote deeper knowledge and increased transparency of compilation processes and quality control procedures in place. This quality communication allows users to increase confidence and analytical interpretation of the statistics compiled, thus promoting a more efficient and proper use of the statistical information released.

This document will focus on the main procedures and best practices currently implemented to ensure the quality of the statistical compilation, allowing a better understanding of its results, seeking to mitigate the possibility of misinterpretation and, simultaneously, contributing to consolidate the confidence of users in the statistics produced by Banco de Portugal.

**2 COOPERATION BETWEEN USERS AND PRODUCERS**

Statistical compilers are always focused on the dimensions of data quality. In fact, the quality dimensions cover all aspects of how statistics meet user needs and their expectations concerning the information disclosed.

Users such as international organizations, the general government, banks, media and the general public (in particular, firms and universities) expect to obtain reliable data upon which they can base their own decisions. Users also expect to get timely data, otherwise the data will be useless. Moreover, they need to know if statistics will be revised in order to increase the accuracy and what is the revisions policy followed by the Banco de Portugal.

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| Figure 1 | Users of statistics |

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Statistical communication is an essential aspect of statistical and financial literacy. Statisticians are often accused of speaking their own language and not be fully understood by the media or the general public. Thus, statisticians need to communicate using accessible language and terminology that are easily recognized by various segments of users.

To allow an easy and quick access to the statistics, *Banco de Portugal* (BP) developed an Interactive Statistics Database (BPstat | Online Statistics) on the BP website. This service offers several facilities and options allowing a user-friendly navigation through the statistical information about the Portuguese economy. Through BPstat, users can access a wide range of series comprising these statistics and corresponding metadata and create their own alerts and tables in the *Personal Area*, after proper registration.

A good statistical communication is also crucial for a greater involvement of institutions that report data on regular basis, contributing to increased efficiency of statistical compilation systems and to improve the quality of statistics. In this context, it is worth mentioning the creation of a "Corporate Area" on the BP website, a privileged system of direct communication between companies and the *Banco de Portugal*, with impact on reducing the costs of reporting and statistical compilation. This service aims to facilitate regular reporting and enhance the quality of elementary information, promoting, simultaneously, a wider use of statistics in particular through the development of feedback information to reporting entities.

In the last years, the Statistics Department of the BP has developed several initiatives to improve the communication quality of their statistics. Statistical information is released on a continuous basis on the BP website with the constant concern of statistics disclosing in a clear and comprehensible manner, in tables and graphs to facilitate analysis and enable correct interpretation of results. In this context, BP has conducted several initiatives addressed to the specialized media in the economic area (workshops with journalists), thematic conferences for companies and universities and other actions aiming at clarifying on the compilation and dissemination process of statistics by the BP.

Another initiative in the framework of statistical communication relates to the publication of quality manuals to help users to improve their understanding of statistics and foster cooperation between users and producers.

**3 QUALITY MANUALS**

The **quality manuals** were developed mainly in a user’s oriented perspective and in a statistical quality control context, to promote a deeper knowledge and an increased transparency of both, the production processes and the quality control procedures in place. Its goal is to raise the understanding of the main procedures and best practices used in the compilation of these statistics, by making it possible to better capture their results, reducing the probability of misunderstandings and, at the same time, helping to consolidate the users’ understanding of and confidence in Banco de Portugal statistics.

Up to now two documents (Supplements to the Monthly Statistical Bulletin), have been prepared and published on the field of statistical quality control: "*Quality management in Banco de Portugal’s statistics*", January 2012, and "*Quality management in monetary financial institutions’ balance sheet statistics*", September 2013, available only in Portuguese.

The quality manuals are generally in line with the principles and indicators of the *Public Commitment on European Statistics by the European System of Central Banks* and contain information about the main characteristics and quality aspects of statistics:

1. ***Legal and institutional environment***

The institutional environment affects significantly the integrity and credibility of the statistical production. The aim of this section is to make known the existing legal framework that gives full authority to the Bank in collecting information for statistical purposes (instructions and warnings issued by the Bank).

The legal framework for Banco de Portugal statistical production is:

* The Organic Law of Banco de Portugal to collect information for the production and dissemination statistics;
* The Law on the National Statistical Systemrecognizes Banco de Portugal as a statistical authority and enshrines its tasks in the scope of the national statistical system; and,
* The mandate of the ESCB to collect information for the production and dissemination of European statistics.

The principle of the confidentiality of individual datais explicitly set out in the Law of the National Statistical System, in the Code of Conduct of Banco de Portugal and in the Legal Framework of Credit Institutions and Financial Companies (to which Banco de Portugal is subject). This principle is enforced in the Organic Law with the obligation of professional secrecy which obliges the Bank staff.

1. ***Methodological framework and statistical sources data***

For users it’s important to know that the methodological framework for the statistical process follows the internationally accepted standards, guidelines or good practices. The goal of this section is to explain the methodological basis of the statistical process (concepts and definitions, scope, classification/sectorisation and basis for recording, among others) and if there is any deviation from the existing methodological rules. It also describes the sources used for the compilation of statistics and if the collection information, from all entities considered as relevant, is of a census nature (covering the universe under observation) or uses sampling techniques (covering only a subset of representative bodies necessary for extrapolation using appropriate statistical techniques).

The methodological framework used for the various statistics:

* follows the internationally accepted standards, guidelines or good practices;
* standard concepts, definitions, scope, classification/sectorisation are consistent with European statistics; and,
* the choice of sources, statistical methods and decisions about the dissemination of statistics follows statistical considerations;

1. ***Quality control procedures***

The processes used for the collection, processing and dissemination of statistics constitute the core of all statistical systems. The purpose of this chapter is to describe issues related to quality control procedures and organizational arrangements implemented in the different phases of the statistical production process (data collecting, data processing and analysis and statistics dissemination).

Quality management is a constant priority shared at all levels in the Statistics Department and several procedures and working arrangements are in place to provide an effective statistical quality control. The statistical quality control in place in the Statistics Department has two levels:

(i) *procedures outside the production cycle*

* Appointment of contact persons in the reporting institutions for each specific statistical data submission. On the other hand, the Bank also informs the reporting institutions of their counterparts in the central bank;
* detailed reporting instructions and handbooks are also delivered to the reporting institutions;
* regular meetings and training sessions with the reporting institutions;
* *Quality Assessment Reports*, produced to assess the quality of current statistical compilation;
* internal working groups to deal with transversal issues relevant for different areas of statistical production; and,
* periodic audit operations to the statistical systems conducted by the Bank’s Audit Department or by the Statistical Department (audit operations focused on the analysis of the statistical characteristics of the compilation systems - these operations are made by the Statistical Audit Unit);

(ii) *procedures during the production cycle*

* *BPnet* - a secure electronic communication system between Banco de Portugal and financial institutions;
* *Corporate Area* - a BP website solution of direct communication between companies and Banco de Portugal;
* *specific designed software* to facilitate data submission to the Banco de Portugal and allowing the automatic validation of the files received from reporting entities;
* as a result of the analysis and quality control developed by the teams, several *validation tests* are performed on individual and/or aggregated data in the different phases of data processing (sources data, intermediate data and final statistical data), and follows mainly three approaches: temporal consistency (analysis of the temporal evolution – month-on-month and year-on-year rates of variation and outliers control), internal consistency (coherence within a set of source data) and external consistency (cross-checking with source data from other sources);
* regular statistical production meetings in order to facilitate data sharing discussion and coordination among all staff.

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| Figure 2 | The statistical quality control SYSTEM |

1. | Uses of statistics
2. ***Quality indicators to assess the statistical compilation***

In order to assess the quality of compiled and disseminated statistics, the Statistics Department developed a set of quality indicators for the various statistics. This assessment focuses on statistical results, basing the analysis on a series of quality indicators, taking into account their specific nature and critical points in their compilation process. To this end, the Data Quality Assessment Framework’s basic structure (the IMF’s benchmark to assess statistical quality) is used as the key reference for this analysis.

The results obtained from such quantitative indicators might help compilers to set priorities in order to improve the quality of statistics and may help users to understand better the quality of data to anticipate the possible size and direction of forthcoming revisions and to evaluate the impact of using different datasets in their analysis.

The assessment analysis is broken down into five assessment levels: **statistical analysis measures, revision analysis, internal consistency, external consistency and consistency over time**.

* ***Statistical analysis measures***

At this level, the goal is to assess whether results for statistics adequately reflect the economic reality, using for that purpose statistical description and analysis measures to assess the quality of statistical calculations. Charts are used to assess developments (internal, external and temporal validation) of the main statistical results and to analyze discrepancies and outliers.

* ***Revision analysis***

The goal is to measure the impact of revisions and the degree of confidence that users can place in the early publications of statistics. For this assessment, specific quality indicators are used to compare the first and last versions released. With these indicators it’s possible to assess the size/magnitude of such revisions.

* ***Internal consistency***

At this level, the aim is to ensure the internal consistency of statistics by monitoring the residual items. By definition, these items include aspects with a residual nature and sometimes have significant values, which should be analysed with particular care.

Internal consistency may also be evaluated in terms of comparison of flows with stocks in order to monitor price changes, currency fluctuations and other adjustments.

Statistics compiled by Banco de Portugal are also consistent within the dataset. Therefore, and strictly in conceptual terms, concepts, definitions and classifications used to compile statistics do not vary, regardless of the frequency of the corresponding statistics.

* ***External consistency***

In the field of external consistency, comparative analysis procedures are performed using BP’s and similar statistics from other sources, when available (cross-checking statistics for comparable phenomena), in order to ensure the overall quality of information disclosed by the Banco de Portugal.

Still in the domain of external consistency, but now to ensure the consistency with other sources of information, it must be referred the cross-checking between statistical information and accounting data, received by Banco de Portugal for supervisory purposes.

With these procedures it’s possible to ensure consistency of the information published.

* ***Consistency over time***

With regard to the time consistency analysis, the goal is to ensure that there are no series breaks in the released data, e.g. due to significant changes in the sources, methodology and/or compilation system.

Significant changes in methodology, sources of information or statistical data collection systems are properly planned, so as to mitigate the effects associated with series breaks, thus ensuring that data remain consistent over time.

Explanatory notes are published as a rule in the Statistical Bulletin on the Bank’s website, explaining the main changes in the statistical results.

**4 CONCLUDING REMARKS**

A key factor in the future success of an organization is its reputation with regard to the quality of its products. Organizations must be dedicated to achieve ongoing improvements in order to meet customer needs as they evolve. As applied to statistics, quality encompasses all aspects of how well statistics meet users’ needs and their expectations about the information content of the disseminated data.

In the light of all the aspects that were presented, it seems obvious that a lot of time and resources are currently dedicated to quality control issues in the Statistics Department of Banco de Portugal, and in our view, high quality standards have been attained so far. This success is largely the result of all staff’s firm commitment towards the central priority of statistical quality control, a highly demanding and time consuming activity. Nevertheless, there is always room for further improvements.

In conclusion, it's not enough to have high quality compilation and dissemination statistical systems. It’s also essential to share with users, the knowledge about the production and quality control processes that insure the compilation of good statistics. Quality manuals on statistics are one way to increase the quality of communication for statistical users.

**References**

[1] European Central Bank (2012), Public Commitment on European Statistics by the European System of Central Banks.

[2] International Monetary Fund (July 2003), Data Quality Assessment Framework.

[3] Damia, Violetta and Aguilar, Carmen (November 2006), Quantitative Quality Indicators for Statistics an Application to Euro Area Balance of Payments Statistics, European Central Bank.