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**THE ECB STATISTICAL QUALITY FRAMEWORK AND QUALITY ASSURANCE PROCEDURES:
AN ASSESSMENT IN THE LIGHT OF THE ATTEMPT TO HARMONISE FRAMEWORKS OF
INTERNATIONAL ORGANISATIONS**

VIOLETTA DAMIA, CATHERINE AHSBAHS, EUROPEAN CENTRAL BANK

1. Introduction

The development, collection, compilation and dissemination of statistics designed to support the conduct of monetary policy and other tasks of the European system of central banks (ESCB) are one of the core functions of the European Central Bank (ECB). For the ECB, adhering to high quality standards is a key factor in maintaining public trust in the ECB statistics upon which policy decisions are based. Therefore, since the start of Economic and Monetary Union the ECB has emphasised key aspects of statistical quality, such as relevance, accuracy, reliability, timeliness, consistency, cost-effectiveness, non-excessive burden on reporting agents and statistical confidentiality. This is why the ECB adhered to the Principles Governing International Statistical Activities in November 2005. Nevertheless, until recently all these issues were not incorporated into a comprehensive quality framework.

To develop and implement a quality framework tailor-made to the objectives¹ of the ECB statistical function, the ECB undertook, as a first step, a stock taking exercise of the existing frameworks that have been developed by National Central Banks (NCBs), National Statistical Institutes (NSIs) and international organisations. These are often referred to as Code of Practice, Code of Conduct, General Operating Framework, etc. However, due to differences in the institutional environments of these organisations, the models developed differ somewhat with regard to their stakeholders, definitions of quality and scope.

Nevertheless, a number of these frameworks have been assessed in order to determine whether they contained elements that could serve the ECB's purposes. As a result, the ECB has developed the ECB Statistical Quality Framework (SQF), which is based on selected components of six different frameworks that have been carved out in order to fit to the ECB institutional environment and operational features. It should be noted that the elaboration of the SQF took due account of the Guidelines for the Implementation of Quality Assurance Frameworks for International Organizations Compiling Statistics that were approved at the 10th Meeting of the Committee for the Coordination of Statistical Activities (CCSA).

The aim of the present paper is to present how the SQF is structured around these six quality schemes used. The skeleton of the SQF is outlined in the appendix.

2. Development of the SQF and synergies with existing quality models

As mentioned above, the SQF was built upon existing quality frameworks that were adapted to the institutional environment and operational features of the ECB. From the frameworks that were analysed, six different models have been selected owing to: (i) a definition of their scope and objectives deemed as appropriate for the ECB statistical function, (ii) interesting features in their implementation and

¹ For more information, see "The ESCB's governance structure as applied to ESCB statistics" at <http://www.ecb.int/pub/pdf/other/escbsgovernancestructureappliedtostatistics200611en.pdf>.

monitoring, and (iii) the existence of clear similarities between the institutional environment of the institution of application and the ECB statistical function.

The table below presents a very short summary of these models together with the elements that were of interest for the development of the SQF with regard to the scope and objectives, the implementation and monitoring and the institutional environment.

Models	Reason of interest for the ECB SQF
United Nations Fundamental Principles of Official Statistics (1994) ²	<ul style="list-style-type: none"> ▪ Provides the foundations for all quality frameworks/Code of Practice.
IMF Data Quality Assessment Framework (2003) (DQAF) ³	<ul style="list-style-type: none"> ▪ Rooted in the UN Fundamental Principles; ▪ Provides an organised structure to assess existing practices against best practices, including international methodologies; ▪ Easily applicable to the ECB statistical function.
Eurostat Quality Definition (2003)	<ul style="list-style-type: none"> ▪ Based on the UN Fundamental Principles; ▪ Focus on output quality criteria; ▪ Of relevance in view of close cooperation between Eurostat and ECB's DG Statistics, as laid down in a Memorandum of Understanding.⁴
OECD Quality Framework (2003) ⁵	<ul style="list-style-type: none"> ▪ Adaptation of the UN Fundamental Principles and the DQAF to the OECD institutional environment, including a proximity to users in the same institution; ▪ Monitoring via the use of quality assurance procedures.
Bank of England Code of Practice (2004) ⁶	<ul style="list-style-type: none"> ▪ Based on the Code of Practice of the UK Office for National Statistics; ▪ Similar institutional environment as the ECB; ▪ Concepts of cost-efficiency and non-excessive burdens to respondents; ▪ The Code is addressed to all stakeholders.

² The Fundamental Principles of Official Statistics were initially developed by the Conference of European Statisticians in the early 1990s and further expanded by the Statistics Division of the United Nations. It is based on ten principles: Relevance, impartiality and equal access; Professional standards and ethics; Accountability and transparency; Prevention of misuse; Sources of official statistics; Confidentiality; Legislation; National coordination; Use of international standards; and International cooperation.

³ The IMF DQAF is articulated around six dimensions that are further broken down into elements and then to indicators. The six dimensions are: Prerequisites of quality; Assurances of integrity; Methodological soundness; Accuracy and reliability; Serviceability; and Accessibility

⁴ See http://www.ecb.int/ecb/legal/pdf/en_mou_with_eurostat1.pdf.

⁵ The OECD Quality Framework is based on the following elements: the definition of quality and its seven dimensions (Relevance; Accuracy; Credibility; Timeliness; Accessibility; Interpretability; Coherence) under the OECD context; a set of principles and core values for conduct of OECD statistical activities and processes (derived from the UN Fundamental Principles and ISI ethics); the procedure for assuring quality of proposed new statistical activities; and a procedure for evaluating quality of existing statistical activities. Its aim is to provide a system for identifying and resolve data quality problems, to increase transparency of processes used by OECD vis-à-vis its main counterparts and to reinforce the role of high quality statistics in its analytical work.

European Statistics Code of Practice (2005) ⁷	<ul style="list-style-type: none"> ▪ Coherent with the UN Fundamental Principles and the IMF DQAF; ▪ Encompasses Eurostat Quality Definition; ▪ Data collected via EU national statistical institutes; ▪ Of relevance in view of close cooperation between Eurostat and ECB's DG Statistics, as laid down in a Memorandum of Understanding.
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2.1. Synergies in terms of scope and objectives

The SQF is a comprehensive quality framework addressed to users, data suppliers and producers of statistics alike. It aims to introduce a harmonised definition of quality for statistics within the ECB and to establish core principles for the compilation and dissemination of ECB statistics.

The main foundation of the SQF in terms of scope and objectives is the UN Fundamental Principles of Official Statistics. Both models aim to maintain the public trust in official statistics, enhance their quality and establish standards and concepts allowing cross-countries' comparisons.

Therefore, the scope and objectives of the SQF are consistent with those of all models that are derived from the UN Fundamental Principles of Official Statistics, i.e. the IMF DQAF, the Bank of England Code of Practice, the OECD Quality Framework and the European Statistics Code of Practice.

The SQF is based on two main components: the definition of quality and a set of quality principles. Concerning the quality concept adopted in the SQF, the statement that statistics must be fit for purpose makes it possible to encompass all aspects of how well statistical processes and output fulfil key stakeholders' expectations. In this context, high quality statistics should: 1) meet users' needs regarding the availability, timeliness and information content of disseminated data, 2) respect the strict confidentiality of the non-public individual information provided by reporting agents, 3) address the concerns of reporting agents and compilers regarding the reporting burden and the compilation costs, and 4) aim to promote the skills and ethical standards of statisticians.

⁶ The Bank of England Code of Practice is based on seven key principles (concerning the relevance, integrity, quality, accessibility, confidentiality, respondent burden and cost efficiency), adapted from the (UK) National Statistics Code to reflect the specialised nature of the Bank's statistical operations and outputs. The Code's design was influenced by international projects to develop frameworks for the assessment of data quality, such as the IMF DQAF. Hence the Code presents a cascading structure, with the seven key principles at the head, branching to sub-principles and thence to examples of their application. The Code aims to (i) set the standards of services that users of statistics and the wider public should expect to receive; (ii) promise a fair treatment to data suppliers and (iii) act as a benchmark for staff involved in developing and delivering the statistical products and services.

⁷ The European Statistics Code of Practice is based on 15 principles with the aim (1) to provide guidelines for the production of credible statistics by independent and accountable institutions and (2) to ensure data providers for the confidentiality of the information they share. The principles are organised into three main blocks: the institutional environment (ensuring the effectiveness and the credibility of the statistical authority producing and disseminating European Statistics); the statistical processes (dealing with the application of good practices in terms of collecting, processing and disseminating statistics); and the statistical output (comforting the convergence of the statistical output to the users' needs).

Regarding the set of quality principles, the SQF shares the holistic structure with the IMF DQAF, the Bank of England Code of Practice and the European Statistics Code of Practice. This structure supports the comprehensive assessment of data quality by covering the institutional environment, the whole statistical production chain including the supporting IT infrastructure and the characteristics of the statistical products.

2.2. Synergies in terms of implementation and monitoring features

With regard to the structure of the SQF, the quality principles selected for the SQF are mostly inspired by the IMF DQAF and the European Statistics Code of Practice. The SQF follows a cascading structure alike the IMF DQAF, according to which quality is assessed on the basis of six dimensions that are further broken down into elements and then to indicators. However, in terms of presentation, the structure of the SQF is more similar to that of the European Statistics Code of Practice.

In both models, the principles are organised into three main blocks: the institutional environment (ensuring the integrity and credibility of the production and dissemination of statistics); the statistical processes (dealing with the application of good practices regarding the processes used for the development, collection, processing and dissemination of statistics); and the statistical output (ensuring the fulfilment of users' needs). Each principle is then accompanied by a set of practical elements.

The main difference between the SQF and the European Statistics Code of Practice relates to the existence of well-defined quality assurance procedures linked to the principles and elements to enable the monitoring and reporting of the framework by the ECB statistical function, whereas the European Statistics Code of Practice is accompanied by a set of guidelines to be followed by Eurostat and the NSIs. In this respect, the SQF follows the system introduced by the OECD and to a lesser extent by the Bank of England.

With regard to the selected quality principles, contrary to the IMF DQAF, both the SQF and the European Statistics Code of Practice include quality principles dealing with the notion of cost-efficiency and non-excessive burden on respondents, which are deemed as very significant for the ECB statistical function. Moreover, due to the importance attached by the data providers, confidentiality constitutes an individual principle in the SQF and the European Statistics Code of Practice whereas in the IMF DQAF it is only an indicator of the quality prerequisites. Both issues are also part of the Bank of England Code of Practice.

2.3. Similarities between the institutional environments

The ECB statistical function presents a number of similarities with the institutional environments of all five other institutions mentioned above.

It is widely acknowledged that the institutional environment significantly affects the integrity and credibility of the production and dissemination of statistics.

An important feature that characterises both the SQF and the Bank of England Code of Practice is the statutory independence of both institutions that also applies to their statistical activities (see Article 5 of

the Protocol on the Statute of the ESCB and of the ECB). This is why this particular aspect is included in both quality models. The SQF also integrates the notion of scientific and professional independence of the statistical function,⁸ which is present in all models selected.

Another important aspect of the institutional environment of the ECB, the OECD, Eurostat and the IMF is that they are all supranational organisations that receive national statistics (data and metadata) that are thereafter processed, analysed and disseminated. Therefore, the quality of the data produced by these organisations is conditional on the quality of the data supplied by the national providers and the quality of their internal processes. In this context, in order to ensure statistical quality, these organisations have to promote coordination and cooperation among national statistical experts, as well as some degree of monitoring of the quality and availability of the national contributions.⁹ Moreover, they have to support the sharing of information and best practices as well as technical know-how for the continuous improvement of the quality and range of statistics. On the other hand, internally, they have to create the preconditions for high quality input from national statistical authorities and to strive for the quality improvement of their statistical processes and output. In relation to the latter, the situation of Eurostat and the ECB is very peculiar compared to the OECD and the IMF in the sense that both institutions compile area-wide statistics that are not just the sum (or average) of Member States' contributions. This poses specific requirements on the quality of their own statistical production processes, similar to that of national statistical institutes and national central banks.

In this context, the OECD Quality Framework and the European Statistics Code of Practice in particular were good examples for the SQF of the type of quality framework an international organisation could adopt in case respondents are national statistical authorities.

The quality models of these institutions were also interesting for the SQF given the similar leading role played by these institutions in the choice of the standards applied to all euro area, European and some international statistics.

This is why the SQF, similarly to the OECD Quality Framework, integrates this important concept in one single principle (see Principle 5 – Coordination and cooperation among the members of the ESCB and with EU and international organisations). Although it is not a supranational organisation, the Bank of England Code of Practice also covers this aspect to take account of its relationship with the Office for National Statistics.

3. Conclusion

⁸ To note that ECB statistics are developed in close consultation with users alike the Bank of England's statistics.

⁹ As an example of monitoring, see the ECB annual quality report on the euro area balance of payments and international investment position statistics at http://www.ecb.int/pub/pdf/other/bop_intinvpos-2008en.pdf.

The SQF sets forth the main quality principles and elements guiding the production of ECB statistics. It serves to ensure that ECB statistics remain fit for use by the ECB and other ESCB users, as well as users outside the ESCB. The SQF is a statement of intent, although most elements are already fully reflected in current practices via a set of quality assurance procedures.¹⁰

While being fully in line with the ECB's institutional framework and the ECB's Mission Statement,¹¹ the SQF has also drawn on work carried out by other institutions in this field. Subsequently, the principles included in the SQF encompass those expressed in the UN Fundamental Principles of Official Statistics and the related Principles Governing International Statistical Activities. The SQF is very similar to the IMF DQAF, the OECD Quality Framework and the Code of Practice of the Bank of England and follows the same structure as the European Statistics Code of Practice. Overall, the main differences between the SQF and these quality models come from the need to reflect the specific institutional environment of the ECB in its quality framework.

¹⁰ See <http://www.ecb.int/pub/pdf/other/ecbstatisticsqualityassuranceprocedure200804en.pdf>.

¹¹ See http://www.ecb.int/ecb/orga/escb/html/mission_eurosys.en.html.

Appendix 1: Link between the SQF and reference models¹²

SQF Quality Principles	IMF Data Quality Assessment Framework	European Statistics Code of Practice	Quality framework for OECD Statistics	Bank of England Code of Practice
Independence and accountability	Indicators of “Assurance of integrity” dimension, “Professionalism” element	“Professional independence” principle (P1)	Main principle of the OECD “Core values for OECD statistics” – accountability issues can also be found under “Credibility” dimension	Accountability issues can be found within the “Integrity” principle
Mandate for data collection	Indicator of “Prerequisites of quality” dimension, “Legal and institutional environment” element	Full principle (P2)	Mentioned under “Relevance” dimension (<i>The OECD Programme of Work provides the mandate for collecting and treating data</i>)	Not explicitly mentioned, however implied under “Relevance” when mentioning the shared responsibility of BoE and ONS re. national statistics.
Impartiality and objectivity	Indicators of “Assurance of integrity” dimension, “Professionalism” and “Transparency” elements	Full principle (P6)	Main principle of the OECD “Core values for OECD statistics” – also mentioned under “Credibility” dimension	“Integrity” principle
Statistical confidentiality	Indicator of “Prerequisites of quality” dimension, “Legal and institutional environment” element	Full principle (P5)	Main principle of the of OECD “Core values for OECD statistics”	Full principle
Coordination and cooperation among the members of the ESCB and with EU			Two main principles of the of OECD “Core values for OECD statistics”	Special focus is given to interrelations with ONS within “Relevance”

¹² Since the European Statistics Code of Practice encompasses Eurostat Quality Definition, the latter model is not covered by the table.

SQF Quality Principles	IMF Data Quality Assessment Framework	European Statistics Code of Practice	Quality framework for OECD Statistics	Bank of England Code of Practice
and international organisations				
Resources and efficiency	Covered under “Resources” element of “Prerequisites of quality”	Partly covered in the “Cost effectiveness” principle (P10)	Main principle of the of OECD “Core values for OECD statistics”	“Cost efficiency” principle
Sound methodology and appropriate statistical procedures	“Methodological soundness” dimension	“Sound methodology” principle	Part of OECD “Core values for OECD statistics”	Sub-principle of the “Quality” principle
Cost-effectiveness and non-excessive burden on reporting agents	<u>Re. cost-effectiveness: ---</u> Re. response burden: indicator of “Prerequisites of quality” dimension, “Legal and institutional environment” and “Resources” elements AND Indicator of “Accuracy and reliability” dimension, “Source data” element	Re. cost-effectiveness: <u>full principle (P10)</u> Re. response burden: full principle (P9)	Re. cost-effectiveness: defined as a “factor” and not as a direct dimension but closely related to all quality dimensions <u>Re. response burden: mentioned under “cost-efficiency” factor.</u>	“Respondent burden” & “Cost efficiency” principle
Relevance of the statistical output	Element of “Prerequisites of quality” dimension	Full principle (P11)	Full dimension	Full principle
Accuracy and reliability (incl. stability)	Full dimension	Full principle (P12)	Full dimension	Sub-principle of the “Quality” principle
Consistency and	Consistency as element of	“Coherence and	“Coherence” dimension	Sub-principle of the

SQF Quality Principles	IMF Data Quality Assessment Framework	European Statistics Code of Practice	Quality framework for OECD Statistics	Bank of England Code of Practice
comparability	“Serviceability” dimension	comparability” principle (P14)		“Quality” principle
Timeliness (incl. punctuality)	Covered under “Periodicity and timeliness” element of the “Serviceability” dimension	Full principle (P11)	Full dimension	Sub-principle of the “Quality” principle
Accessibility and clarity	Accessibility is a full dimension, also covering the concept of clarity and the assistance to the users	Full principle (P15)	Full dimension restricted to the media of information used.	“Accessibility” principle

Appendix 2: Structure of the ECB Statistics Quality Framework (SQF)

1. Objectives & addressees

1.1. Objectives of the SQF

- a. Support the fulfilment of the ESCB objectives.
- b. Support the fulfilment of the ECB and Eurosystem Mission Statement.
- c. Provide a benchmark for quality to ECB staff working in the area of statistics.
- d. Furthermore, as a communication instrument, contribute to maintaining public's confidence in the ECB statistics upon which policy decisions are made.

1.2. Addressees

- The users of ECB statistics: internal users (e.g. the Executive Board, Governing Council and General Council of the ECB) and external users (e.g. international and national organisations, authorities, etc.).
- The data providers: euro area NCBs, in some cases NSIs, and direct respondents.
- The data compilers and the DG-S staff in general.

2. Definition and concept

The SQF has three components: (i) definition of quality, (ii) quality principles and (iii) quality assurance procedures.

1. Definition of quality

High quality statistics should:

- a. meet users' needs regarding the availability and information content of disseminated data,
- b. respect the rights of reporting agents regarding the strict confidentiality of the non-public individual information provided,
- c. address the concerns of reporting agents and compilers regarding the reporting burden, and
- d. aim to promote the skills and ethical standards of statisticians.

2. Quality principles

Institutional environment

P1. Independence and accountability

In the context of the statistical work undertaken at the ECB, there are two parts to the notion of independence. First, the statutory independence of the ESCB and of the ECB, it shall not “seek or take instructions from Community institutions or bodies, from any government of a Member State or from any other body”. Second, the production of ECB statistics conforms to the criteria of scientific and professional independence. The ECB is accountable to the European Parliament and the public at large. It is transparent about its activities and takes full responsibility for the statistics that it compiles and disseminates.

P2. Mandate for data collection

The ECB has a clear mandate to collect statistical information from the competent national authorities or directly from economic agents in order to undertake the tasks of the ESCB. Moreover, it is empowered to impose sanctions on reporting agents which fail to comply with their obligations.

P3. Impartiality & objectivity

The ECB shall compile and disseminate ECB statistics in an impartial and transparent manner. ECB statistics shall be equally accessible to all users in order to maintain public confidence in the integrity of the policy decisions based on them.

P4. Statistical confidentiality

The protection of confidential statistical information collected by the ECB, with the assistance of the NCBs, is guaranteed. Statistical information received from NSIs or the European Commission (Eurostat) is only used for statistical purposes. Moreover, the ECB shall take all regulatory, administrative, technical and organisational measures that are necessary to protect confidential statistical information from disclosure or unlawful use.

P5. Coordination and cooperation among the ESCB and with EU and international organisations

The ECB shall promote coordination and cooperation among ESCB statistical experts and between the ESCB and European and international organisations to support the sharing of information and best practices as well as technical know-how for the continuous improvement of the quality and range of euro area statistics.

P6. Resources and efficiency

Human and financial resources, facilities and the IT infrastructure are used as efficiently as possible and are commensurate with the statistical work programme.

Statistical processes

P7. Sound methodology and appropriate statistical procedures

In developing and compiling statistics, the ECB shall use a sound statistical methodology based on ESCB and European Community legislation and standards, and/or internationally agreed standards, guidelines or best practice. Effective and efficient statistical procedures are implemented throughout the statistical production chain.

P8. Cost-effectiveness and non-excessive burden on reporting agents

The ECB shall set up appropriate procedures to enable users' requirements to be met while minimising the burden on reporting agents and without compromising the quality of ECB statistics. Moreover, it strives for cost-effectiveness in developing, collecting, producing and disseminating statistics.

Statistical output

P9. Relevance

ECB statistics shall meet stated or implied user needs. These needs may alter over time as a result of changes in the economic environment.

P10. Accuracy and reliability (including stability)

ECB statistics shall accurately and reliably assess the phenomenon they are intended to measure.

P11. Consistency (or coherence) and comparability

ECB statistics shall be consistent (1) over time, (2) within the dataset that is published in a single release, (3) across datasets, and (4) across different frequencies for the same dataset. Furthermore, they shall enable international comparisons to be drawn.

P12. Timeliness (incl. punctuality)

ECB statistics shall be timely and punctual.

P13. Accessibility and clarity

Information on data and metadata shall be presented in a clear and understandable form and shall be easily and freely accessible to all users.