Promoting the Quality of Official Statistics: the Role of International Cooperation

Paolo Garonna[*] and Tiina Luige[**]

1. PREFACE: THE QUALITY OF SWISS STATISTICS

Discussing issues of statistical quality in the context of the Swiss Society of Economics and Statistics is a particular challenge for the following three main reasons.

First of all, between quality and Switzerland there is an intense, almost intimate relationship. Quality is one of the flagship features of the Swiss trade-mark. It suffices to mention the world renowned „quality" of Swiss production in precision instruments and financial services, the quality of the Swiss participatory democracy and social cohesion, the quality of science and research, the quality of life in the attractive Swiss valleys and cities, etc. Striving for quality is much more than a characteristic of the Swiss „model": it is part of the DNA of the Swiss nation; it is what keeps this nation together, strong and cohesive.

Second, in the last decade, based on an ancient and prestigious tradition, the quality of the Swiss Federal Statistical System has made tremendous progress under the enlightened leadership of Mr. Carlo Malaguerra. We would like to mention only two most remarkable success stories: the review of Swiss public statistics carried out in the year 2000, which has set a bold precedent for other statistical systems to follow; and the Montreux Conference on „Statistics and Human Rights", which has opened up a new fascinating and complex field of study and policy work. Swiss statistics are in the „vanguard" of the world-wide quality movement. The Swiss Federal Statistical System is an active and powerful partner and supporter of United Nations statistics and of the global effort to aid statistical capacity building in the transition and developing countries.

The third reason relates to the fact that one of the authors is Italian, and has been involved in the development of the Italian statistical system for many years, more recently as Director of the Italian national statistical institute. There are many and strong links between Italian and Swiss statistics. These links have old and prominent roots in the history of the two countries and European culture. In 2001 we celebrate the 200th

[*]   University of Padua and UNECE Statistical Division, C.456, Palais des Nations, CH1211, Geneva
      10, Switzerland, e-mail: paolo.garonna@unece.org
[**] UNECE Statistical Division, C.400, Palais des Nations, CH1211, Geneva 10, Switzerland, e-mail:
      tiina.luige@unece.org
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      United Nations.

Anniversary of the birth of Carlo Cattaneo, the great 19th century European thinker and social scientist, whose ideas about devolution and federalism have been for too long neglected, notably in Italy, but now have come to be widely recognised and supported. Cattaneo was the first to speak of the need to create some kind of „United States of Europe", having in mind the Swiss „confederal" model, to which he was particularly attached. Cattaneo contributed also significantly to Italian statistics. He was a close friend of Stefano Franscini, the founding father of Swiss Federal Statistics, and prominent statesman and political scientist in the troubled period of mid-19th century Switzerland, and Europe.

2. THE PRESENT CONTEXT FOR THE STATISTICAL QUALITY DEBATE

Data quality is increasingly a policy relevant issue. It is not simply of concern for statisticians, academics and analysts, but also politicians, social partners and the public opinion. The discussion therefore has not only taken place in academic journals and technical forums, but also, and increasingly, in national parliaments, international conferences and the first pages of the main newspapers. For instance, the issue of revisions of the Gross Domestic Product (GDP) entered the heated electoral campaign in Italy for the political elections of 2001. Another example: the 16 November 2000 editorial of the Dagens Nyheter,[1] the largest and most influential Swedish paper, claimed that investment in Sweden has been underestimated by a large amount (127 billion SEK) in the last eight years; the following debate has put into question the reliability of economic statistics facing rapid changes in the IT sector. A similar criticism was expressed in the August 2000 issue of the Deutsche Bundesbank Report.[2] International comparisons of GDP growth rates between Europe and the United States – the Report says – are distorted by dissimilar methods of deflation: in 1999 the discrepancy in the measurement of investment in information technologies between Germany and the U.S., due to different deflation methods, was well over 170 %. If we apply U.S. or world prices to deflate expenditure on IT equipment in Germany, the annual increase in IT investment from 1991 to 1999 would amount to 27.5 %, rather than 6 % as registered in the official figures. This discrepancy would reflect itself significantly on growth and inflation comparisons, casting considerable doubts on the quality of basic information available to markets and investors.

The tendency to set policy goals in quantitative terms adds another element to the political significance of data quality. This tendency can be clearly seen not only at national level, but also in international summits setting quantitative goals and specifying commitments in terms of targets and indicators (e.g. the Millennium Declaration[3], Summits in

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1. Reliability of economic statistics, in: *Dagens Nyheter*, 16 November 2000.
2. Deutsche Bundesbank, *Report*, August 2000.
3. The Millennium Assembly of the United Nations, Millennium Summit, New York, 2000.

Beijing[4] (1995), Rio[5] (1992), Cairo[6] (1994), the European Union Summit in Lisbon in March 2000, etc.). Statistics has been upgraded from a merely descriptive and analytical tool into a policy implementation instrument. Monitoring quantitative, time-bound targets and benchmarking are increasingly recognised as being central to policy implementation and follow-up. This growing political importance of statistics entails increased attention to their quality.

Globalisation is another aspect that brings along an intensified attention to quality. The lack of transparency in international markets, particularly the financial markets, but also the market for skills, services, and knowledge, has been called into question to account for misallocation of resources and instability. Often low quality statistics have been blamed as a major cause of market opacity, uncertainty and imbalances. International crises have then provided a stimulus to improve the quality of data available for international market players. For example, following the Mexico crisis, the need to avoid financial break-down, and the contagion effects spreading rapidly all over the globe has driven the IMF to devote considerable resources and attention to improving the quality of financial and economic statistics worldwide (CARSON, 2000). In the European context, statistics has played an important and positive role in European integration: the Maastricht process for European Monetary Union was based on the credibility of the convergence criteria, which led to harmonise and synchronise the production and dissemination of basic national data, from inflation and national accounts to government deficit and debt. The Growth and Stability Pact, the „Luxembourg process" for promoting best practice in European employment policies, and more recent initiatives in the field of European social policies are all based on a set of comparable quality statistical indicators.

But the political relevance of data quality goes well beyond the economic sphere. Lack of public data, or low quality of public policy information, affects good governance, the accountability of democratic institutions. Therefore it undermines confidence in public policies and democracy, and weakens the extent of „social capital" of a country, i.e. the trust and cohesion of a public community.

Lately, the new environment created by the intangible economy, globalisation, liberalisation and structural change have provided a new stimulus to the quality focus. There is a growing threat of mis-measurement. Measuring productivity in the service economy, the contribution of gender to production, services in the domestic economy, the role of the underground sector, the process of creation and accumulation of knowledge through education and training, e-business and the quality of life are increasingly difficult to estimate on the basis of conventional data and indicators. New concepts that have become dominant in the policy discourse, such as „sustainable development", „human security", „good governance", „empowerment", „customer satisfaction" and „social cohesion" are still awaiting appropriate measurement tools. The new measurement challenges have a

4.   Fourth World Conference on Women (FWCW), Beijing 1995.
5.   United Nations Conference on the Environment and Development (UNCED), Rio de Janeiro, 1992.
6.   International Conference on Population and Development (ICPD), Cairo, 1994.

decisive influence on the design and implementation of new policy approaches. The quality of statistics has a direct impact on the quality of policy making and the quality of decision making by business and ordinary citizens. Improving data quality is then perceived as a necessary pre-requisite for improving policy making and democracy.

3. IN SEARCH OF A COMPREHENSIVE THEORETICAL FOUNDATION

There are many approaches to statistical quality. The literature is vast and multifaceted. The practical approaches are even more varied and dispersed, not necessarily corresponding to different theoretical perspectives. In the next two sections, we will provide an overview aiming at putting on a sound theoretical basis the complexity and diversity of the current approaches.

As official statistics are part of the infrastructure of public goods, the discussion over statistical quality can be seen as part of the wider drive to improve the quality of the public sector and public services. Administrative reform and the reshaping of the public sector in advanced countries have put quality at the centre of public policy attention, following the so called „new public management" paradigm (LÖFFLER, 1996). Basically, two different streams of thought have converged in the direction of this new paradigm: (a) the new „institutional economics" focusing on concepts like contestability, incentive structures, internal markets, transparency, asymmetric information, and users' choice; and (b) the introduction of private sector management practices into the public sector. Quality and customer orientation have then become central goals of administrative modernisation.

The first basic feature of the theoretical framework is that quality in statistics is a multidimensional phenomenon, encompassing various aspects and issues related to the quality of statistical data (e.g., accuracy, timeliness, reliability, relevance, etc.) and of the processes for producing good quality data at the national and international level. There are many factors and dimensions at play. Moreover, when establishing a framework for statistical quality assessment, we need to take into account the views of all involved players: the data producers, the data providers and all the different kinds of users with their differing needs for quality. They all have their own distinct, and legitimately different, approach to quality.

The methodology expert working on the design of a sample survey, the economic forecaster, the politician, the trade unionist, etc. have different quality perceptions and requirements. The major challenge therefore is to bring these differing frameworks in line with one another so that a true quality system can be set in place. This operation, which has both conceptual and practical implications, requires addressing complex issues, such as:

-   What is the relative importance of the different aspects and dimensions of statistical quality?

- Is it possible to weigh, rank or score the different factors? Are there reliable syn-
  thetic indicators to guide management decisions?
- What is the underlying model of quality production and delivery? Reference to sub-
  stantive theory is needed: how are statistics used in decision making by policy ma-
  kers, and ordinary citizens? How are they applied to labour and skill markets or fi-
  nancial markets? Is there a „representative user" of official statistics, as there is a
  representative consumer in general economic equilibrium?

Figure 1: The multidimensional space of statistical quality enhancement
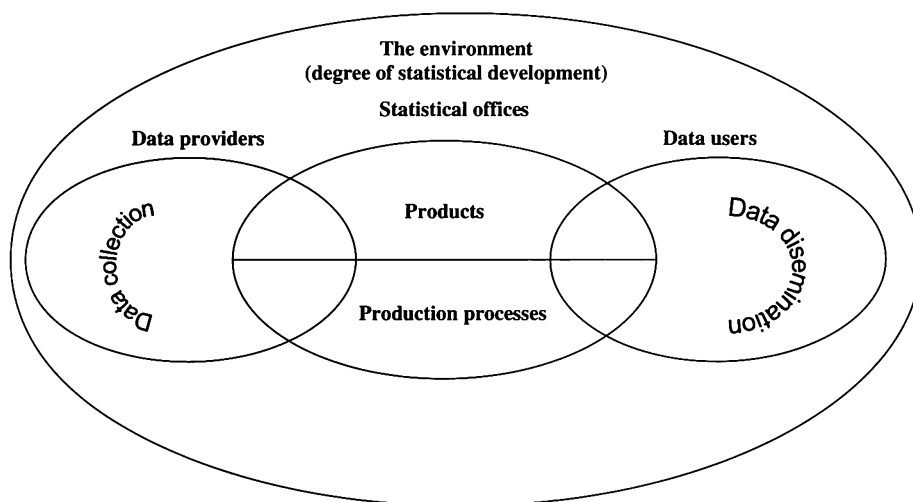
To bring together the many and different factors into a consistent framework, one needs
a solid theoretical foundation. This was the case of national accounts, which were made
possible by Keynesian General Theory and its neo-classical synthesis. Unfortunately, in
spite of the considerable progress made by the new economics of information, we still
lack a general and convincing theoretical/conceptual approach to the analysis of the pro-
duction and use of information for generating knowledge, and therefore value and distri-
bution. The economics of public information is still – on the whole – a black box.

4. STATISTICS AND QUALITY: A DIACHRONIC PERSPECTIVE

Statistics have always provided powerful tools and support for a science-based approach
to quality management in business and government. However, there has been a clear
evolution in the role and impact of statistics on quality, in relation to shifting economic
and social conditions and in line with changing economic and management thinking.
  In a „stylised" and drastically simplified presentation of the relationship between

quality and statistics through time, we will distinguish three basic „models" of quality management, corresponding to different stages of development of production structures and management philosophy.

We will call them: the „Fordist" model of quality management, the „post-Fordist" model, and the Total Quality Approach (see Table 1). For each model, we will briefly present the definition of quality, the methods and organisation, and the statistical inputs to the quality approach. The definition of quality itself has changed through time, reflecting the changing environmental requirements. Quality management orientation methods and organisational arrangements have changed as well. The main common point is that statistics have played a fundamental, albeit markedly different, role in the three models.

Table 1: Quality from a diachronic perspective

	„Fordist" model	**„Post-Fordist" model**	**Total Quality Approach**
Context	– Taylorist work organisation and standardised mass production – Oligopolistic conditions (seller markets)	– Complex external systems (vertical disintegration) – Shorter product cycles and customised production – De-industrialisation – Buyer markets, stronger competition or monopolistic competition, SME	– Globalisation (systemic competition – national innovation systems) – Information society and e-economy – De-industrialisation – Good governance and institutional reform
Definition of quality	– „conformance to required technical characteristics" – norms and standards	„fitness for use", i. e. meeting objectives of various customers	Total Quality Management (TQM) is a process of organisational change, application of quantitative methods and human resources for continuous improvement to meet better the needs of customers now and in future
Focus	Final product	Production process, continuous improvement of product quality	Both products and process
Orientation	– producer oriented perspective – objective – static	– consumer oriented – subjective	– Combines traditional process-oriented quality control with customer-oriented quality assurance – Targets external and internal customers, organisation defined as a network of customer relationships – TQM extensively applied to the public sector

	„Fordist" model	„Post-Fordist" model	Total Quality Approach
Method	Quality supervision and inspection	Quality assurance management systems, i.e. prevention of quality problems through planned systematic activities	– Company-wide quality control – Benchmarking (quality awards, citizen's charters) – ISO 9000–9004
Organisation	– Quality supervision becomes a specialised task assigned to top level specialised departments – Third party assessments	– System-oriented approaches including the whole company in functional hierarchical terms – Human resource management crucial, „quality is everybody's job" – Shift of quality control from inspection departments to top management – Third party assessment at the operational level	Self-assessment
Statistical inputs	– Statistical quality control techniques – Sampling applications – Design of experiments	– Development of management information systems for quality control – Quality costs, calculations and accounting – Direct marketing	– MDSA, policy impact analysis – Customer satisfaction surveys – Measurement of outcomes, e.g. in education from attainment to client measurement of skills and competencies (literacy, numeracy, „life skills", problem solving)

The *„ Fordist" model* typically corresponds to the dominant post-war characteristics of Taylorist work organisation and standardised mass production (LÖFFLER, 1996). Market conditions imposed then to produce standard products at acceptable quality levels and at the least possible price for mass consumption. Quality was correspondingly defined as „conformance to required technical characteristics", i.e. a list of recognised technical specifications defined from the engineering point of view. Norms and standards were set with reference to technical aspects of the final product; and the focus of the quality strategy was on the product. The quality perspective was producer oriented, objective and static. Its evaluation had in fact to be based on hard data and detailed objective specifications, and would not need to reflect the evolution of tastes, demand and technologies, perceived anchored to the satisfaction of the basic common needs of mass markets. Quality supervision and inspection were then introduced in the normal operation of the large enterprise. The organisation of work was based on the separation of „hand and head work", so that the monitoring activities became the exclusive task of special hierarchical and functional units, as superior and separate tasks. Quality inspection had a

technical function: to check conformance of products to the required norms and standards. The percentage of unacceptable products determined the quality of production. It did not reflect the evolution of tasks/demands/technologies. Price was the decisive competitive parameter on the market and the goal of producers was to produce a certain level of quality at minimal cost. This concept of quality fitted well those goods and services whose characteristics the producer can fully specify before sale and the consumer can therefore investigate before purchase.

The „post-Fordist" model corresponds to that stage of industrial development where basic needs are fulfilled and the market reaches maturity. The economy is then characterised by more complex production systems (vertical disintegration), shorter product cycles, product differentiation, monopolistic competition and the need for customising production. Also the types of goods being produced are changed: with the growth of the service sector comes the increase in the share of the so-called „experience goods" which are impossible to investigate before purchase. This situation forces managers to orient the meaning and management of quality more towards customers. The producer-oriented quality concepts and management systems then become inappropriate. The behaviour of customers is conditioned by increasing material well being. Low prices are not enough to attract customers. Quality came then to be defined as „fitness for use" (JURAN and GRYNA, 1980), i.e. meeting the objectives of various customers. In this sense, quality becomes a subjective concept, as it has to be measured not by technical data but by consumer satisfaction. The final test of quality is the maximisation of the utility functions of users. Quality management starts to focus on the production process, rather than on the product, and on the prevention of quality problems through planned and systematic activities. The organisation of quality control meant the establishment of quality assurance systems, involving the whole company in functional and hierarchical terms.

This coincides with the discovery of the important role that managers and employees play in this process. Quality assurance started to be based on the idea that „quality is everybody's job" (DEMING 1986). Human resource management became crucial. In practice, responsibility for quality assurance shifted from separate inspection departments to the whole of the top management of the enterprise.

The advent of „Total Quality Approach" signals a further shift in the quality paradigm, linked to the new context of global competition, the e-economy and the information society. The approach to productivity and competitiveness becomes much broader encompassing not only human capital but also social capital, good governance and institutional reform. Correspondingly the concept of quality becomes broader: „Total Quality (TQ)" represents the process of organisational change itself, i.e. the application of quantitative methods and human resources for the continuous improvement of production to better meet the needs of customers now and in the future. TQ requires the full and active involvement of all employees as well as effective information systems. The organisation of quality control turns from essentially third-party assessment to generalised self-assessment. Customer orientation refers not only to the external clients, but also to the „internal customers" of a given department, so that the whole company can be inter-

preted as a network of customer relationships. As a consequence, all management efforts concentrate on the fulfilment of customer expectations. Market research acquires an important strategic function in company-wide quality control. Moreover, this new philosophy makes the approach perfectly applicable, and extensively applied, to the public sector.

Quality has evolved thus from a technical function to a strategic business goal. The „quality era" is heralded by the general awareness of quality concerns in management and economic practises, by the generalisation of the client-provider relationship, as well as by competition through quality awards, benchmarking, peer pressure and citizens' Charters. In the economy it bolsters the share of services based on personal company-customer relationships rather than on a standardised production process. The TQ concept combines the producer-oriented quality control with the customer-oriented quality assurance, so that the idea of customer-orientation is also introduced into the production process. The calculation of quality costs and benchmarking are used as tools to collect information needed for external and internal customers, internal processes and competitors.

The development of statistical tools for quality measurement and promotion has accompanied the evolution and shifts in quality philosophy. In the „Fordist" quality model, statistical quality control techniques were widely used, with an intensive application of sampling methods and statistical design of experiments. In statistical production, technical norms and standards were set, often at the international level. This effort led to the establishment of definitions and classifications of statistical concepts.

In the „post-Fordist" model, the statistical inputs into quality management evolved into the development of complex information management systems for quality control. Quality costs, calculations, quality accounting and direct marketing were intensively applied to planning, monitoring and evaluation.

The TQ approach foresees an even larger and more sophisticated tool-box of statistical techniques and applications: multivariate data systems analysis (analyse des données), customer satisfaction surveys, automatic data collection mechanisms, probabilistic data editing, policy impact analysis, measurement of outcomes, not only outputs. The implications of measuring outcomes in the public sector is illustrated in Figure 2 (LÖFFLER 1996). For example, in the field of education, the measurement of the effectiveness of a specific programme means shifting from measuring attainment to direct measurement, and monitoring of skills and competencies (literacy, numeracy, so-called „life skills", such as problem solving abilities). Scoring and ranking tools based on complex information systems and data models are increasingly used for evaluation, auditing or accreditation.

Figure 2: Measuring performance of public policies and institutions
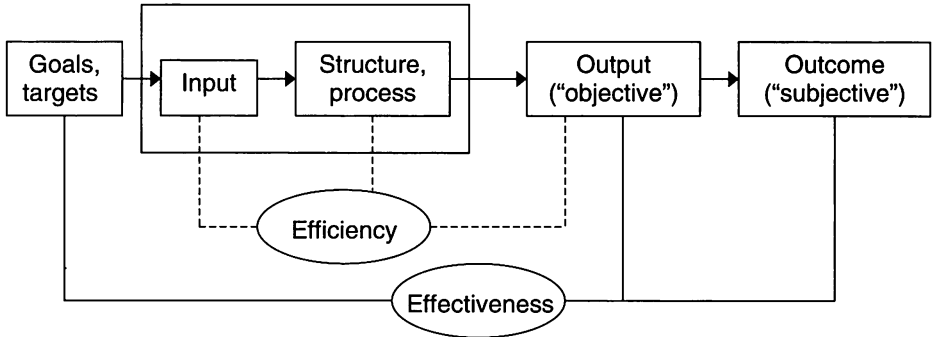
To conclude, statistics has not simply followed, but accompanied, supported, and at times even preceded, the shift in quality management philosophies and models. In turn, quality concerns and approaches have affected the development of official statistics, its production, dissemination and use in analysis and decision-making.

5. INTERNATIONAL COOPERATION FOR QUALITY STANDARDS

Setting standards and norms as part of quality assurance strategies has stimulated an intense, and continuous, set of activities at national and international level for almost 200 years. There is an ancient and prestigious tradition contributing to the establishment of statistical concepts, norms and classifications. Since the beginning, this tradition has given an important role to international cooperation. Statistics were always perceived as a potentially universal language, and as a tool for international dialogue. The International Statistical Congresses were established by Adolphe Quetelet in the middle of the 19th century, well before the League of Nations and the United Nations. There are many examples of such international efforts, like the International Classification of Diseases, or the Censuses Guidelines.

In the 1990's, the major international effort for statistical standards was the adoption of the United Nations Fundamental Principles of Official Statistics (1992: 35–36, see Table 2). They were enacted first by the Conference of European Statisticians in 1992 in Geneva, then endorsed by the UN Statistical Commission in 1994. The inspiration for establishing this set of Principles, which represents some kind of international constitution for official statistics, was given by the need to support the transition to democracy and the market economy after the collapse of Communism in the former Soviet block. But the exercise proved to be beneficial in clarifying what constitutes good practise in all statistical systems, therefore also in advanced and in developing countries.

These 10 principles deal with:

- relevance, impartiality and equal access;
- professionalism;
- accountability, i.e. the dissemination of metadata;
- prevention of misuse;
- cost effectiveness and minimum burden on respondents;
- confidentiality;
- normative framework, i.e. the operation of effective statistical laws;
- national coordination;
- international standards;
- international cooperation for statistical capacity building.

Table 2: Fundamental Principles of Official Statistics

1. Official statistics provide an indispensable element in the information system of a democratic society, serving the government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honor citizens' entitlement to public information.

2. To retain trust in official statistics, the statistical agencies need to decide according to strictly professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.

3. To facilitate a correct interpretation of the data, the statistical agencies are to present information according to scientific standards on the sources, methods and procedures of the statistics.

4. The statistical agencies are entitled to comment on erroneous interpretation and misuse of statistics.

5. Data for statistical purposes may be drawn from all types of sources, be they statistical surveys or administrative records. Statistical agencies are to choose the source with regard to quality, timeliness, costs and the burden on respondents.

6. Individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes.

7. The laws, regulations and measures under which the statistical systems operate are to be made public.

8. Coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system.

9. The use by statistical agencies in each country of international concepts, classifications and methods promotes the consistency and efficiency of statistical systems at all official levels.

10. Bilateral and multilateral cooperation in statistics contributes to the improvement of systems of official statistics in all countries.

In order to help statistical offices and users of public statistics in monitoring and implementing these principles, the United Nations Statistical Division has opened in 2000 a Web-site collecting good practices in statistics. This tool aims at creating peer pressure and providing examples of how the Fundamental Principles are implemented in statistical practice. The site can be consulted at the following address: http://www.un.org/Depts/unsd/goodprac/default.asp

The most striking feature of the Fundamental Principles is the fact that the conventional methodological approach to quality focused on „accuracy" or methodological soundness does not stand out as a dominant component. One finds in fact some reference to accuracy and statistical methods in Principles no. 2 (Professionalism), 3 (Accountability) and 5 (Cost effectiveness). The rest of the Principles concern other aspects, such as the relevance of data, the modalities of data dissemination, the delicate issue of „integrity" of statistical authorities, institutional factors, etc. This clearly shows that the Principles reflect an evolution of the quality approach towards what we have called the „Post-Fordist Model", and therefore a definition of statistical quality inspired by the „fitness for use" management approach. The traditional measures and indicators of accuracy, such as standard errors, confidence intervals, bias, but also non-sampling errors, continuity over time, frequency and sizes of revisions, survey response rate and the frame coverage, coding errors, etc., can be found implicitly in the criteria of professionalism (second principle) or in that of accountability and metadata (third principle). Moreover, one has to consider that the Fundamental Principles are complementary to other more specific sectoral norms and standards in the field for instance of national accounts, industrial statistics, migration, Censuses, etc. In the sectoral standards, more emphasis is placed on definitions of concepts, classifications and statistical methodologies. Nevertheless, the UN constitution for official statistics focuses the concerns and the guidelines for statistical quality on the aspects related to the use and accessibility of data, such as relevance, timeliness, confidentiality, rather than on technical norms and methods. The credibility of official statistics is perceived linked more to those aspects, than to the technical skills for the collection and the processing of data. The „governance" of statistical systems is more crucial to quality than the techniques and technologies required by the profession.

The emphasis on institutional factors appears even more clearly in the International Monetary Fund's (IMF) approach. This organisation has taken a leadership role in the international quality enhancement dialogue. The main reason for such a leadership is the IMF exposure to scrutiny and growing pressures on data quality coming from financial markets and other key users of statistics, who have a vested interest in ensuring data quality. The IMF data quality framework has developed in 3 stages:

- First, the Special Data Dissemination Standard (SDDS)[7], launched in 1996 and the General Data Dissemination System (GDDS)[8] in 1997 grew in the aftermath of the Mexican crises in 1994–1995, and the following discussions on the role of poor data quality in fomenting financial instability. This phase was limited to monitoring dissemination practises, which however account for most of the problems of integrity and reputation of impartiality.
- The second stage addressed more directly questions of data quality. The IMF data quality initiative was intended to prevent and overcome the difficulties created by mis-reporting of data by countries to IMF in the context of IMF loan programmes

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7.   IMF, *Special Data Dissemination Standard (SDDS)*, http://www.dsbb.imf.org.
8.   IMF, *General Data Dissemination System (GDDS)*, http://dsbb.imf.org/gddsindex.htm.

(CARSON, 2000). This did as a matter of fact take place in South-East Asia, and was seen as one factor behind the shortcomings of the IMF surveillance role in the events leading to the financial crises in Asia, Latin America or the CIS.
–   In the late 1990's the IMF extended its role of structural surveillance to cover also matters of statistical quality. The standard Reports on the Observance of Standards and Codes (ROCS) of the IMF were extended to include not only compliance with banking and prudential regulation, but also data quality norms and standards.[9] Once again, this development was stimulated by the reaction to the financial crises of the late 1990's in Russia, Asia, Turkey, and elsewhere.

The history of the IMF data quality framework shows that unfortunately we often learn through crises and mistakes. The financial situation has provided in the past, and will probably continue to provide in the future, many opportunities for learning and promoting mechanisms for statistical quality control. The pattern experienced in the case of the IMF signals also a new approach to setting quality standards and control mechanisms: rather than having the statisticians develop in isolation statistical norms and methods, statisticians participate to quality enhancement, standards and regulation exercises led by main constituencies of data users, like – in this case – the financial institutions, banks and financial regulators.

The IMF data quality framework has five main dimensions:

–   integrity;
–   methodological soundness (e.g. the 1993 System of National Accounts and the IMF Balance of Payments Manual);
–   accuracy and credibility;
–   serviceability (relevance, timeliness, revisions);
–   accessibility.

In addition, the framework covers some prerequisites setting institutional conditions for quality, like the state of the legal environment, the amount of available resources that are commensurate with the needs of statistical programs, the existence of quality awareness and information mechanisms to check whether quality is recognised as being central to statistical work. A list of quality indicators has been established for a diagnostic preview, addressed particularly at non-statisticians, like financial market operators and decision makers (see Table 3). This list aims at permitting the assessment of compliance in relation to the individual quality dimensions of the framework. The operationalisation of the IMF quality framework is still under consideration: at the moment it is being made available for use within national statistical systems or for international comparisons. From the list it can be seen that for the indicators of methodological soundness, accuracy and reliability, reference is made to sectoral, dataset-specific or country-specific frameworks.

9.   IMF, *Country Reports on the Observance of Standards and Codes*, http://www.imf.org/external/np/rosc/index.htm.

Table 3: IMF Statistical Quality Indicators

IMF Statistical Quality Indicators
Prerequisites of quality
The responsibility for compiling statistics is clearly specified.
Staff, financial, and computing resources are commensurate with institutional functions.
Processes are in place to focus on quality, to monitor the quality of the production and dissemination of statistics, to acknowledge and deal with tradeoffs within quality, and to inform planning.
Integrity
Advance notice is given of major changes in methodology, source data, and statistical techniques.
Methodological soundness
Concepts and definitions: see dataset-specific framework [for guidance about the applicable international standard].
Scope: see dataset-specific framework [for guidance about the applicable international standard].
Classification/sectorization systems: see dataset-specific framework [for guidance about the applicable international standard].
Accuracy and reliability
Source data are collected from comprehensive data collection programs that take into account country-specific conditions.
Serviceability
Processes to monitor the relevance and practical utility of existing statistics in meeting users' needs are in place.
Timeliness follows dissemination standards.
Statistics are consistent or reconcilable with those obtained through other sources and/or statistical frameworks.
Accessibility
Statistics are released on a pre-announced schedule.
Documentation on concepts, scope, classifications, basis of recording, data sources, and statistical techniques is available, and differences from international standards are annotated.

6. INTERNATIONAL STATISTICAL STANDARDS

As we saw, most conceptual and methodological standards are still formulated and monitored at the sectoral level. However, the international dimension of standard setting remains essential. Most sectoral standards are defined or harmonised at the international level. There are international statistical standards in all major fields of statistics: the System of National Accounts (SNA) revised in 1993, Balance of Payments, government finance, consumer price indices, Censuses, economic and social classifications, etc.

The United Nations Economic Commission for Europe has played a leadership role in the development of international standards and recommendations. For instance in the European Comparison Program, standards have been defined to build Purchasing

Power Parities; guidelines on the dissemination of statistical metadata were formulated; common approaches and recommendations were issued for the dissemination of statistics through Internet. An „integrated presentation" of the statistical work programmes of all major international organisations is compiled by the Conference of European Statisticians; this is an effective tool for coordinating statistical activities at the international level.[10]

Statistics have played an important role in the process of European integration, which, in turn, has provided a great momentum for advancing European statistics as a whole. Several success stories can be mentioned where statistics have played an integral part of an effective policy convergence strategy. For instance, this is certainly the case for the Maastricht convergence criteria, which have been the basis for achieving the European Monetary Union.

Other good examples of successful international cooperation for statistical quality enhancement are related to prominent international initiatives, like those aimed at poverty reduction in the context of the debt reduction proposal agreed in Cologne, those linked to sustainable development, those directed at supporting good governance and statistical capacity building, like the so-called Paris-21 initiative.

7. NATIONAL STATISTICAL QUALITY PROGRAMMES

There have been many statistical quality programs designed and implemented at the national level. Several of these are dealing with measuring the performance of statistical offices. The already mentioned peer review of the Swiss Federal Statistical Office (SFSO) carried out in 2000 is a particularly successful experience (MALAGUERRA, 2001). It has set a bold example for other statistical agencies to follow. Contrary to what happened in other cases of statistical systems review, in the case of Switzerland the review was initiated and promoted by the SFSO itself. It was not in response to a confidence crisis, or a major restructuring plan, but rather a physiological approach to strengthen public trust in statistics, and engage in a open and transparent debate on statistical quality. This model has had a great impact at the international level, and is generally recognised as best practise in statistical quality reviews.

Other examples of national quality programs have followed different patterns and formats. For instance, external audits have been carried out in Statistics Sweden, Statistics Netherlands, the Office for National Statistics of the United Kingdom. A famous case of quality auditing was the Boskin Commission in United States (GORDON, 2000), which was set up to investigate the reliability of the consumer price index in the U.S. in relation to cost of living indicators. Corporate planning and program monitoring systems

10. UN/ECE Statistical Division, *Programmes of international statistical work in the ECE region 2001/2002 and 2002/2003: an integrated presentation*, available at http://www.unece.org/stats/archive/ docs.ip.e.htm.

have been adopted and implemented in several statistical offices, like in Canada, the U.S. Bureau of Labour Statistics and the U.S. Census Bureau, Denmark, Australia, New Zealand.

Increasingly, self-assessment mechanisms are being experimented upon. For instance, staff surveys, customer surveys, simple checklists and internal audits have been successfully introduced in some offices (e.g. Eurostat, Statistics Sweden, Statistics Finland).

Performance indicators were considered and discussed in-depth at the Seminar Session of the annual meeting of the Conference of European Statisticians in June 1999.[11] The need for an integrated system of performance monitoring in statistical systems was emphasised there. Such a system should focus on medium and long-term performance monitoring and quality management, and not on the day-to-day operational management of individual programs. The performance of a National Statistical Institute is a multidimensional concept: different audiences are interested in different dimensions of that performance. The proposed performance dimensions of statistical reviews included the viewpoint of users (quality of products), funding agencies (financial performance), respondents (response burden) and employees (performance of human resources management). In addition, there are other important cross-cutting aspects that require attention in measuring performance: namely innovation, the impact of key findings, professional standards and service delivery standards.

One of the main conclusions of the discussion at the Conference of European Statisticians was that influential users of statistics, especially the players in international financial markets, in general require some form of external audit. A mere declaration by producers of official statistics on the quality of their products and their ways of functioning would not be considered sufficient to command trust and respect from users.

8. THE SYSTEM AND THE PROCESS OF QUALITY ENHANCEMENT

The essence of the TQ approach is in that there are different quality aspects and dimensions, which are to be integrated within a consistent framework. Quality can only be improved by promoting the positive interplay of its various components, rather than operating on any single element in isolation. Moreover,quality is an asymptotic concept; it needs continuous investment and improvement. Quality enhancement therefore is a process requiring a dynamic approach and mechanisms that stimulate continuous improvement, review, innovation, etc. International cooperation has to focus on what creates and maintains quality in a statistical system and on the mechanisms ensuring that quality efforts are sustained.

It is well known that the market mechanism, however imperfect or distorted it may be, is the most efficient instrument for integrating different aspects and satisfying custo-

11.   See the documents for the Conference of European Statisticians' Plenary Session at
      http://www.unece.org/stats/documents/2000.06.ces.htm.

mers' requirements. It is encouraging then to consider that there is a growing market of statistical data and other products. There may be also an emerging market for statistical quality. Assessing the risks posed by low-quality data, and ensuring against them, may become potentially viable, and commercially interesting for business auditing and rating firms, financial institutions, business consultants and insurance companies. A market for „data quality derivatives" may be around the corner, under the pressure of the demand for quality rating, scoring and benchmarking. These developments would provide competition and innovation in the promotion of higher data quality.

However, statistics remain by-and-large a public good. Therefore it is in the public system that mechanisms for data quality improvement have to be found, as part of strategies to promote good governance and effective policy delivery.

Considerable experience has been made in developing in the public sector mechanisms that emulate the market by promoting recognition, reputation effects and peer pressure. At the international level, national statistical systems can be seen to interact and compete, in analogy to what happens with national production and innovation systems; therefore international policy dialogue may represent a powerful stimulus to quality improvement.

In relation to policy-making, we can see a two-way relationship at play: on the one hand, the quality of statistics promotes the quality of public policies and institutions; on the other hand, the strength of democracy and the quality of „governance" put pressures on statistical producers and data analysts to improve quality. This shows how important it is in a working democracy to link data quality enhancement as close as possible to policy preoccupations and objectives.

The key challenge is integrating not only the different quality perspectives, but also the main players, such as the statisticians, the policy-makers, the academics, the analysts, the media, etc. A quality framework in fact is not only a technical and management tool, an intellectual construction, but also a trusted agreement, a sort of „social contract".

Dialogue with the research and academic community is particularly important for defining the underlying model of data use for decision-making and for the accumulation of knowledge. How does quality of information affect policy decisions? What impact does it have on the decisions of ordinary citizens in the labour market, for saving or investment? In spite of the growing economic literature on asymmetric information and incomplete contracts, the conceptual framework for the production and use of statistics is still rather weak. It still looks like a black box. The international dimension in this dialogue is especially relevant, since the critical mass of resources and commitment can be more easily found, and peer dialogue and reviews can benefit from the variety of experience and experimentations. Moreover, international cooperation can play a role of prudential supervision and surveillance over the quality of statistics, educating the different players and raising the awareness of data users over quality.

Maintaining the focus on policies, and policy priorities at national and international level is probably the most critical element of a data quality strategy. This purpose must attract the converging efforts of statisticians and analysts, private and public, academic

and government experts. Being driven by policy users; making sure that they understand and appreciate the importance of statistics for decision-making; look forward towards emerging policy concerns and issues; consolidating the links and bridging the gaps between data users and producers: these goals are inherent in the mission of United Nations statistics.

Ultimately, the question of data quality can be posed in the terms used by the poet:

„Where is the knowledge we have lost in information? Where is the wisdom we have lost in knowledge?" (T. S. Eliot)

because quality amounts essentially to this: the quest for excellence, the prise for wisdom!

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SUMMARY

International cooperation and dialogue are powerful tools for enhancing statistical quality. Activities aiming at setting statistical standards and norms as part of quality assurance strategies have taken place for almost 200 years, not only at the national but also at the international level.

This paper focuses on the role that international cooperation can play to strengthen the systems and the processes for statistical quality enhancement. It provides an overview of the main theoretical approaches to quality, their evolution through time and their links with the economic and social context. Several important cases of international cooperation are then discussed with a view to illustrating the range and variety of the aspects underpinning data quality. Among them: the United Nations Fundamental Principles of Official Statistics, the data quality frameworks set by the IMF and Eurostat, the various standards and classifications in all major fields of statistics from Censuses to national accounts, the Paris-21 initiative for statistical capacity building in transition and developing countries, etc. The paper concludes by highlighting the main challenges and directions for future research.

ZUSAMMENFASSUNG

Die Qualität von Daten gewinnt zunehmend an politischer Bedeutung. Sie ist nicht mehr nur für Statistiker, Akademiker und Analysten ein Anliegen, sondern auch für Politiker, Sozialpartner und die Öffentlichkeit. Die Verwendung von Statistiken in der Politik hat das Augenmerk auf die Datenqualität gelenkt.

Internationale Zusammenarbeit und Dialog sind geeignete Mittel um die Qualität der Statistik zu verbessern. Seit nahezu 200 Jahren werden Massnahmen zur Entwicklung nationaler und internationaler Standards und Normen ergriffen mit dem Ziel, die Datenqualität zu gewährleisten. Einige Beispiele für fruchtbare Zusammenarbeit sind: die Grundlegenden Prinzipien für die amtliche Statistik, die Rahmenstruktur für Datenqualität des IWF und von Eurostat, Standards und Klassifikationen in allen wichtigen Feldern der Statistik, die Paris-21 Initiative, etc. Qualität ist ein asymptotisches Konzept – es bedarf der kontinuierlichen Bemühung um Verbesserung. Deshalb ist die internationale Zusammenarbeit auf diesem Gebiet von größter Bedeutung, um die Qualität der amtlichen Statistik auch in Zukunft voranzubringen.

RESUME

La qualité des données est de plus en plus une question pertinente politique. Elle ne présente pas simplement un intérêt pour les statisticiens, les académiciens et les analystes,

mais aussi pour les politiciens, partenaires sociaux et l'opinion publique. L'utilisation po-
litique des chiffres statistiques entraîne une attention particulière sur leur qualité.

La coopération internationale et le dialogue représentent un outil très puissant pour
renforcer la qualité des statistiques. Les activités menées pour la mise au point de stan-
dards et normes nationaux et internationaux, tout en garantissant leur qualité, sont sui-
vies depuis presque 200 ans. De nombreux exemples de résultats de coopération fruc-
tueuse peuvent être cités: Principes fondamentaux des statistiques officielles; cadres de
données qualitatives par le F.M.I. et Eurostat; standards et classifications dans tous les
secteurs principaux des statistiques; l'Initiative Paris-21, etc. La qualité requiert un in-
vestissement continu et des améliorations. En conséquence, le rôle de la coopération in-
ternationale dans ce secteur reste vital en vue de promouvoir la qualité des statistiques
officielles aussi dans le futur.