Quality Assurance for Consumer Price and MIP Statistics

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Official statistics is more and more used in support of specific policy frameworks. Consumer price and MIP statistics are good examples. The statistics have to comply with high quality standards and the user, the policymaker, has to have an assurance of the quality of the statistics used in policymaking. A quality assurance framework is thus an essential part of the statistical production process.

The two quality assurance frameworks described in this paper share similar philosophy and have several common elements. At the same time there are certain differences. The quality assurance framework for consumer price statistics is established and implemented since a while. The quality management framework for MIP statistics is in its initial stage, in spite of the elements which already exist for the different statistical domains within MIP statistics but are not sufficiently harmonized and developed to comparable standards. The difference is also the scope of the statistics and related quality aspects. While the consumer price statistics represents one statistical domain, MIP statistics exists in the form of a set of indicators from several statistical domains based on quite different types of data. This leads to certain additional quality considerations.

1. QUALITY ASSURANCE FRAMEWORK FOR CONSUMER PRICE STATISTICS

1.1. Background

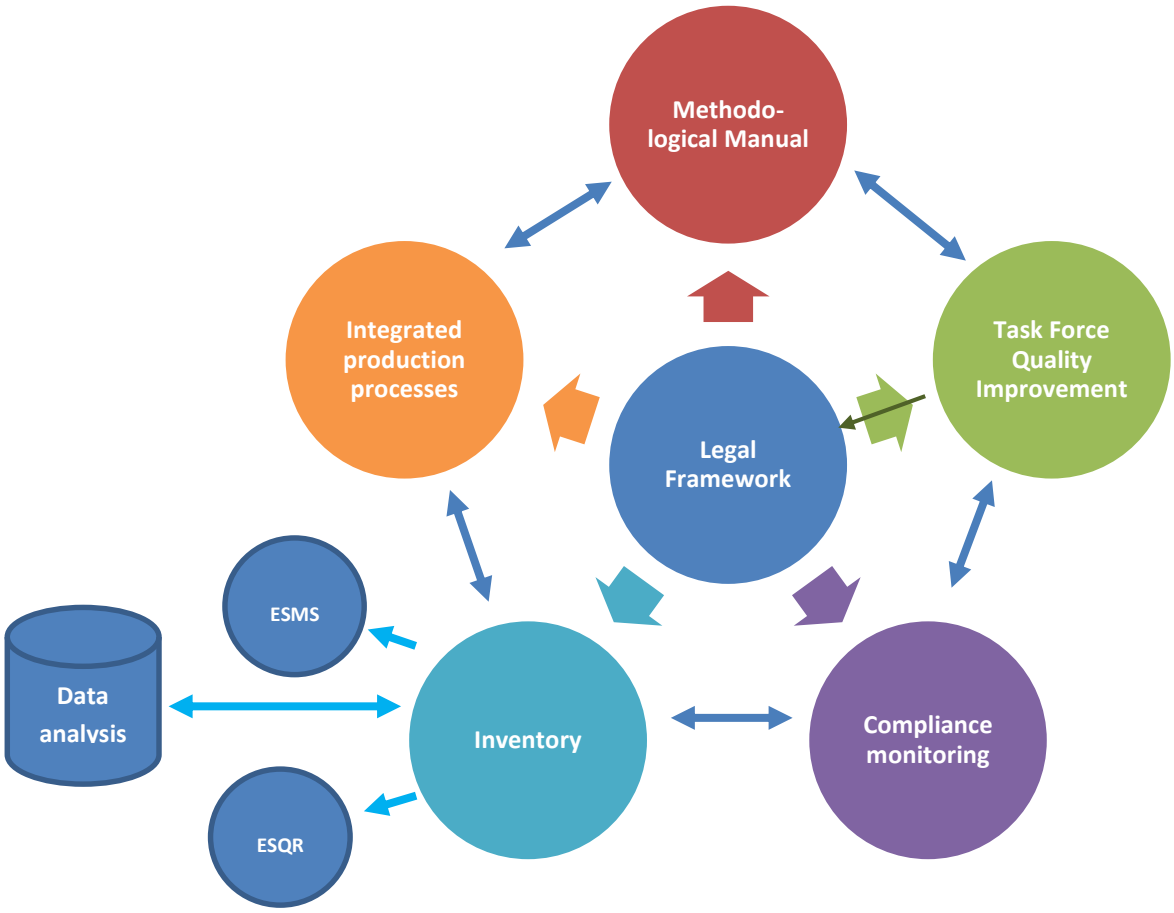
Harmonised Indices of Consumer Prices (HICP) and Housing Price Statistics (HPS) are a cornerstone for European policy making, in particular for monetary policy of the European Central Bank (ECB), but also for market surveillance and macroeconomic imbalance monitoring by the Commission. It is therefore of upmost importance to assure high quality statistics in this area, i.e. data that is fully comparable across countries and across time, always timely and accurately measuring inflation.

Eurostat is setting up a system of monitoring the quality of HICP and HPS based on five pillars:

- ✓ a comprehensive legal framework;
- ✓ a methodological manual of guidelines, examples and good practices;

- ✓ an Inventory of national sources and methods;
- ✓ regular compliance monitoring visits and
- ✓ a dedicated Task Force on Quality Improvement.

Fig. 1: the HICP/HPS Quality Assurance System



1.2. Legal Framework

The legal framework is the backbone of the HICP/HPS quality assurance process. A HICP Framework Regulation was adopted in 1995, followed by 20 Implementing Regulations. In 2012-13, Eurostat in close cooperation with Member States and key users has worked on an updated legal framework, consisting of a Core Regulation, an Implementing Act and a Delegated Act.

The planned Implementing Act would merge all existing Implementing Regulations, consolidating the detailed rules for producing HICP and HPS and adding new rules where it seems appropriate for a modernised HICP and HPS production process that assures full comparability of the inflation measures. National Statistical Institutes (NSIs) have to follow precise and detailed rules in their production process, which assure the high uniform quality of HICP and HPS.

The discussion of the proposed new basic legal act in Council and Parliament will start in late 2014; it is planned to be adopted end of 2015.

1.3. Methodological Manual

The draft legal framework foresees a Methodological Manual which contains recommendations, explanations and examples for producing HICP and HPS. These recommendations are not legally binding, but they facilitate the harmonised implementation of the binding rules of the Regulations by NSIs.

If a NSIs deviates for whatever reason from the recommendations of the manual, transparency is required: this means that the NSI informs Eurostat of the reasons for the different approach and quantifies the consequences for HICP or HPI.

In the Compliance Monitoring process, Eurostat assesses the degree of compliance of NSIs not only with the legal requirements, but also with the recommendations of the manual in order to assure high quality indices.

A Methodological Manual for HPS already exists; for HICP, a draft text was written in 2013; it is planned to be finalised end of 2015.

1.4. Inventory

The Inventory of national sources and methods is at the centre of quality assurance of HICP and HPS. It focuses on more than hundred categories on data collection in all its forms, the treatment of confidentiality, the handling of specific product groups, the weights used, the process of quality assurance in the NSIs, the accuracy, timeliness, comparability and coherence of the statistics and various aspects of dissemination. The information of the Inventory informs all stakeholders how the National Statistical Institutes (NSIs) compile their HICP and HPS in practice. The inventory is also the backbone of the metadata information feeding both the Euro SDMX Metadata Structure - ESMS - and the quality report according to the ESS Standard for Quality Reports (all together SIMS - Single Integrated Metadata Structure).

Work on the inventory has been started in 2012; half the countries supplied an inventory by spring 2014, the others will follow in the course of 2014. The Inventory will be updated at annual frequency.

1.5. Compliance Monitoring Visits

Based on the detailed information of the Inventory (in the past based on ad hoc questionnaires) Eurostat experts visit at regular intervals (about every four to five years) each NSI in order to check if the production process for HICP and HPS is fully compliant with the rules of the legal framework and the recommendations issued by Eurostat and laid down in the Methodological Manual. Weak points are identified and recommendations how to improve are developed, including the follow-up timetable.

1.6. Task Force Quality Improvement

Last but not least, a 'Task Force Quality Improvement' with experts from Eurostat, the NSIs, the ECB and the National Central Banks meets several times per year to discuss outstanding methodological issues and develops recommendations for further harmonisation. So far Internet purchases, the handling of discounts, the treatment of rents, of package holidays, of flights and of telecommunication was discussed. Also the introduction of games of chance into the HICP was discussed. In 2014 the treatment of new and used cars, financial and banking services, purchase of personal computers and tablets etc. are on the agenda.

These recommendations are endorsed by DMES (Directors of Macro Economic Statistics) and published on a Wiki website. They are then included and further explained in the Methodological Manual, where in addition examples of good practice guide NSIs towards their implementation.

1.7. Overall functioning of the system

The specificity of the HICP/HPS system is to combine in a "cyclical" approach the definition-facilitation-implementation-improvement of the underlying framework. This cyclical approach allows to take into consideration innovation, to address methodological issues and to incorporate outcomes and further elaborations in the methodological, production and legal frameworks.

Eventually, dedicated quality actions are put in place on special occasions such as the euro-changeover for countries joining the euro area.

2. QUALITY MANAGEMENT AND MONITORING FRAMEWORK FOR MIP STATISTICS

2.1. The purpose of quality assurance

The Macroeconomic imbalances procedure (MIP) belongs among key European policy frameworks in the area of macroeconomic developments. The policy is based on extensive use of macroeconomic statistics. The MIP scoreboard indicators are used within the MIP for evaluation of the performance of EU Member States against the threshold values defined for identification of possible macroeconomic imbalances and loss of competitiveness. The MIP scoreboard indicators serve as a first filter for a decision whether the statistics indicates a possibility of macroeconomic imbalance and whether more in depth analysis of the macroeconomic trends in the given EU Member State is needed. For the in depth analysis the Commission then may use any additional or more detailed statistics which enable to conclude whether macroeconomic imbalance really exists.

In this context MIP statistics has to comply with high quality standards. Therefore a well-defined quality management and monitoring framework is necessary.

The quality management and monitoring framework for MIP statistics should serve triple purpose:

- To assure the users and policymakers that MIP statistics are compiled in line with high quality standards,
- To enable the monitoring of the quality of the MIP statistics with regard to the fit for purpose criterion,
- To enable setting of priorities with regard to quality improvement actions in the area of MIP statistics.

2.2. Why a specific quality management and monitoring framework for MIP statistics?

The MIP is using broad range of macroeconomic statistics. Quality assurance frameworks already exist in most of these statistical areas, including national accounts, balance of payments statistics, price statistics, EDP statistics or the labour market statistics. The question is, why a specific quality management and monitoring framework for MIP statistics is needed. Aren't the existing quality assurance frameworks in the different statistical areas sufficient also for the MIP purposes?

The answer is related to the necessity to ensure and assess the fitness for purpose of the MIP relevant statistics and to the need of standardisation and harmonisation of the quality activities related to the statistics for the MIP.

In a situation when most of the MIP relevant statistics is already covered by quality assurance frameworks in the different statistical domains it is quite logical to build on these existing frameworks as much as possible. The existing domain specific quality assurance frameworks however might not reflect properly aspects important for the MIP. Therefore it is necessary to adjust and enhance the MIP statistics quality assurance framework to the requirements and specificities of the use of the statistics for the MIP.

The MIP statistics quality assurance framework has to focus on those quality dimensions which are of particular relevance for the use of the statistics in the MIP. The statistics should in this context be fit for purpose and the fit for purpose criterion is thus a crucial principle for designing the quality management and monitoring framework for the MIP relevant statistics.

The heterogeneity of the existing domain specific quality assurance frameworks also reflects historical developments, where some of the quality assurance frameworks are more advanced, e.g. in the case of statistics for EDP, than others, which exist in less developed or very basic form, especially in relatively new statistical areas, such as house price statistics. In this situation it is not possible just to use the sum of existing domain specific quality assurance frameworks. This would result in a rather diversified and unequal approach to quality of the different statistical indicators for the MIP.

The MIP statistics quality management and monitoring framework should provide a sufficiently standardised and harmonised approach to quality of the statistics. The user should have a reasonable assurance that similar quality requirements are put on the different MIP statistical indicators or at least that the quality information available for the individual

indicators is complete and exhaustive in a comparable manner and enables appropriate quality assessment of the statistics.

2.3. The structure of the quality management and monitoring framework

The quality management and monitoring framework for MIP statistics consists of several components arranged in a logical and hierarchical structure. They include the existence of adequate information base in the form of documents containing information about the statistical production process and about the statistics, which together with adequate assessment methodology enables monitoring and assessment of the quality of the statistics. The results of this evaluation are communicated via corresponding channels, such as quality assessment reports or comments accompanying releases of the data, to the users of the statistics. At the same time the results of the quality monitoring and assessment process are the input in the decisions about, and implementation of, quality improvement actions. The quality improvement actions should lead to improved quality of the statistics. This is the ultimate purpose of the quality management and monitoring framework.

In more concrete terms, the functional architecture of the quality management and monitoring framework for MIP statistics should consist of several layers of activities and outputs:

- ✓ The bottom of the pyramid of the quality management and monitoring framework is represented by the different sources of information which can be used for the analysis, monitoring and assessment of the quality of the MIP relevant statistics. This includes the inventories of sources and methods which are documents describing the production process of the given statistics, listing the data sources, describing the methods used in compilation of the data, sampling techniques, estimation methods, revision policies, etc. The information base further includes quality reports prepared on national level by Member States and by domains prepared on the level of Eurostat or ECB. The quality reports should be drafted in a way which provides the information on the different quality dimensions as defined in the European statistics code of practice or in the basic statistical regulation. For reasons of comparability and consistency the inventories and quality reports should follow the established standards developed for these types of methodological documents such as the SIMS, ESMS or ESQRS. Missions to the Member States are another source of information on the quality of the statistics. The missions often focus on specific methodological and data compilation issues with quality implications and the results of these missions described in the mission reports thus provide valuable, focused and detailed information for quality assessment. Finally the data themselves are the basic source of quality relevant information. The data in the form of time series might contain structural breaks. The outliers, strange values or inconsistencies with alternative data sources can be good material for quality analysis. The revision databases are the precondition for performing revision analysis.

- ✓ Once the necessary information base is established it is necessary to define the methodology of quality assessment of the MIP relevant statistics. This includes on the one hand the definition of the relevant quality dimensions or standards to be used in

this assessment. The particular use of the statistics in the MIP predetermines which of the quality dimensions as broadly defined in the European statistics code of practice are the most relevant for the MIP statistics. The fitness for purpose of the data with regard to their use in the MIP context should in this connection be the leading element in the design of the quality assessment procedure. Accuracy and reliability and coherence and comparability of the data between countries and in time seem to be the most relevant quality dimensions to be applied in the quality assessment of the data. The quality assessment should however at the same time focus on the quality of the production process when producing MIP relevant statistics. The focus is then on use of sound statistical methods and analysis of potential risks to statistical production. The quality of the statistical production process and quality of the data are closely linked and are in a way just two sides of the same coin. Use of appropriate production processes and the application of sound methods consistent with international standards are the preconditions for the quality of the data in terms of accuracy, reliability, coherence and comparability.

- ✓ Once the relevant quality dimensions are identified, adequate methods and procedures for the quality assessment of the MIP statistics should be defined and established. These procedures will use the information from the information base in the bottom of the pyramid of the quality management and monitoring framework, will focus on the relevant quality dimensions and will apply adequate analytical or assessment approaches. This might include broad spectrum of activities such as risk assessment focusing primarily on the statistical production process, analysis of information in the inventories of sources and methods and quality reports, revision analysis or detection of structural breaks, outliers or other strange values. The different quality assessment methods provide information about different aspects of quality of the data and of the statistical production process.

- ✓ The results of the quality assessment should then be communicated to the users and policymakers via adequate communication channels. A regular quality assessment report on MIP statistics drafted in a nontechnical language and providing information about the quality of the statistics within the main statistical domains relevant for the MIP is one possible channel of communication on the quality of the MIP relevant statistics. The statistical part of the annual Alert Mechanism Report of the Commission as a starting point of the annual cycle of assessment of macroeconomic developments in the Member States offers also the possibility to include information about the quality of the data and about the robustness of the statistical production processes. This is also the case of the annual official news release of the MIP scoreboard by Eurostat. This can contain information on quality of the data, e.g. in the form of reservations, if the quality assessment leads to justified concerns.

- ✓ The ultimate purpose of the quality management and monitoring framework for the MIP statistics is to ensure the quality of the MIP statistics and its further improvement. The assessment of the quality of the statistics should thus lead also to proposals how to improve it and to initiation and implementation of these quality

improvement actions. The quality improvement work can have different forms depending on the nature of the quality issue. It can have the form of dedicated Task Forces working on specific methodological or data compilation issues. The results can be methodological documents such as guidelines, best practices or handbooks which define ways how to deal with given methodological and quality issues. The implementation of the quality improvements can be in the form of changes in the statistical production system, in the used methodology, design of the survey sample, classification, estimation method, etc. The actions can be done on the level of the ESS if the quality improvement issue is of general nature relevant for all Member States or on the level of individual countries when the issue is country specific.

2.4. MIP statistics as a set of indicators

MIP statistics belongs to a category where we speak about a set of indicators (and the statistics is used in this way), rather than about one indicator which is the case, e.g. of the HICP or GNI. In the case of EDP the set of headline indicators are just the two indicators: debt and deficit. On the other hand there are other EU policy frameworks which are supported by sets of indicators.

MIP statistics is in this respect more comparable to such sets of indicators as the Europe 2020 indicators, the sustainable development indicators or the principal European economic indicators. In all these cases the statistics is in the form of a well-defined set of indicators. Even if the policy use and the policy frameworks are quite heterogeneous, the fact that the statistical support is in the form of a set of indicators leads to certain common features and aspects which have to be taken into account when setting up the set of indicators and which are also related to quality of the statistics.

The user might assume that the individual indicators in the set are of comparable quality. This might not be true or might not be feasible to achieve due to the differences in the compilation of the different indicators. There might be differences in the overall quality of the indicators and there are also different trade-offs between their different quality dimensions. The type of quality issues related to different indicators in the set also differs reflecting the nature of the statistics. Thus within the MIP set of indicators the quality issues related to government debt which is based on accounting data will be quite different from, e.g. quality issues related to the current account indicator where its components are based on rather heterogeneous data sources and data compilation procedures.

It is therefore important to disseminate detailed quality information so that the user can understand the data and make their correct interpretation.

When choosing and defining a set of indicators for a particular policy use it is desirable to put together indicators of high and comparable quality. This was also one of the main considerations used in the process of defining the MIP scoreboard and auxiliary indicators.

The fact that MIP statistics is in the form of a set of indicators has implications for some of the quality dimensions as defined in the European statistics code of practice or in the Regulation (EC) No 223/2009 of the European Parliament and of the Council.

Relevance

Relevance of a set of indicators relates to how the set covers the given complex phenomenon or policy framework. In the case of MIP it is expected that the indicators in the set will cover the main dimensions of macroeconomic developments which were identified by macroeconomic theory and by analysis of recent cyclical developments as the key aspects which indicate or lead to macroeconomic imbalances and loss of competitiveness and potentially result in economic and financial crisis. The backward looking approach to the choice of the MIP scoreboard indicators represents one of the risks of the statistical support of the MIP. Some economists warn that the trigger of the next economic and financial crisis might not be known now and thus the indicator set used in support of the policy might not be complete and fully relevant with regard to the future risks.

Coherence

Consistency and coherence is important for statistical indicators in general. For statistics presented as a set of indicators consistency and coherence between the indicators are even more emphasized. Coherence and consistency is ensured if the indicators originate from within a statistical accounting framework or from statistics which is produced using standardized and harmonised statistical approaches. For many of the sets of indicators used in policymaking this is often not the case. The statistical data are collected on different populations, sampling techniques differ, different classifications are used. Putting together these different statistics while they might cover well the dimensions of the described phenomenon thus does not mean that the set provides a perfectly consistent and coherent statistical picture.

In the case of MIP statistics coherence and consistency were among the main principles guiding the choice of the indicators. The emphasis was on choosing indicators originating, where possible, from the accounting framework of national accounts and balance of payments. This would ensure the methodological consistency among the indicators in the set. The coherence between the flow and stock indicators, e.g. in case of private credit flow and private debt with regard to consolidated or nonconsolidated data was another principle applied during the choice of the indicators.

Parsimony

The number of indicators within a set is also important. The statisticians speak in this connection about the parsimony of the set of indicators.

The set shouldn't contain more indicators than necessary. Too many indicators are not easy to interpret, the message which it is supposed to provide might not be clear and the user might be even misguided. The overlaps between indicators should be avoided and less important statistical information should be excluded.

At the same time the set should contain enough indicators to cover the main features of the given phenomenon. Too few indicators are not sufficient, especially in case of a complex policy, initiative or phenomenon which the set is supposed to describe.

The 11 headline indicators of the MIP scoreboard seem to comply with the above criteria and are roughly comparable with the numbers of headline indicators used within the Europe 2020 strategy, the EU Sustainable development strategy or with the Principal European Economic Indicators used for the analysis of cyclical developments of the EU economy.

For more detailed analysis within the MIP the Commission uses the set of auxiliary indicators plus any other relevant economic statistics. This statistical practice is also broadly used within other EU policy frameworks such as the Europe 2020 strategy, which, next to the headline indicators, is supported by a broad spectrum of additional indicators illustrating its 7 flagship initiatives or the EU sustainable development strategy with its 10 quite diverse objectives supported in total by around 130 indicators arranged in a hierarchical structure around the headline indicators.

2.5. Eurostat Task Force on MIP

The work programme of the Task Force on MIP established in Eurostat in 2014 includes the above elements of the quality management and monitoring framework and its logic. The activities focus on the analysis of existing methodological and quality related information, its further enhancement and standardisation. In this context emphasis is put on the development of harmonized templates for the inventories of sources and methods and for quality reports which would provide required information of the production of the statistics for MIP and its quality. The templates are developed while respecting the standards defined for the methodological documents in the ESS.

The focus is further on the development of the quality assessment methodology and its practical implementation. This includes among other things the development of a risk assessment tool for the evaluation of quality risks for the MIP statistics. The tool should focus both on the quality of the statistical production processes and on the quality of the data. The intention is also to use the revision analysis as an element in the quality assessment process. This requires the setting up of the revision database for the MIP relevant indicators, its regular update and maintenance, definition of the objectives which the revision analysis should focus at and corresponding choice of statistical/econometric indicators which will be used for meeting the objectives. The implementation of the revision analysis should be based on the use of a revision analysis tool, which would enable fast and automatized production of the results. Next to these more specific activities there is the regular systematic work based on checking and analysing the data, analysing the available methodological and quality information, contacts and exchange of information with statistical production units in Eurostat and with other stakeholders in the Commission and outside the Commission, as well as contacts with Member States statistical institutes. The results of the quality assessment of the MIP statistics are then communicated to the users.

Essential part of the work of the Eurostat Task Force on MIP is the dissemination of the MIP relevant statistics in the form of the regular annual news releases, contribution to and future production of the statistical annex of the Alert Mechanism Report, maintenance, update and further development of the dedicated section of the Eurostat web page.

Quality management and monitoring framework for MIP statistics