Quality Indicators: a proposal to assess quality for Services Producer Price Indices

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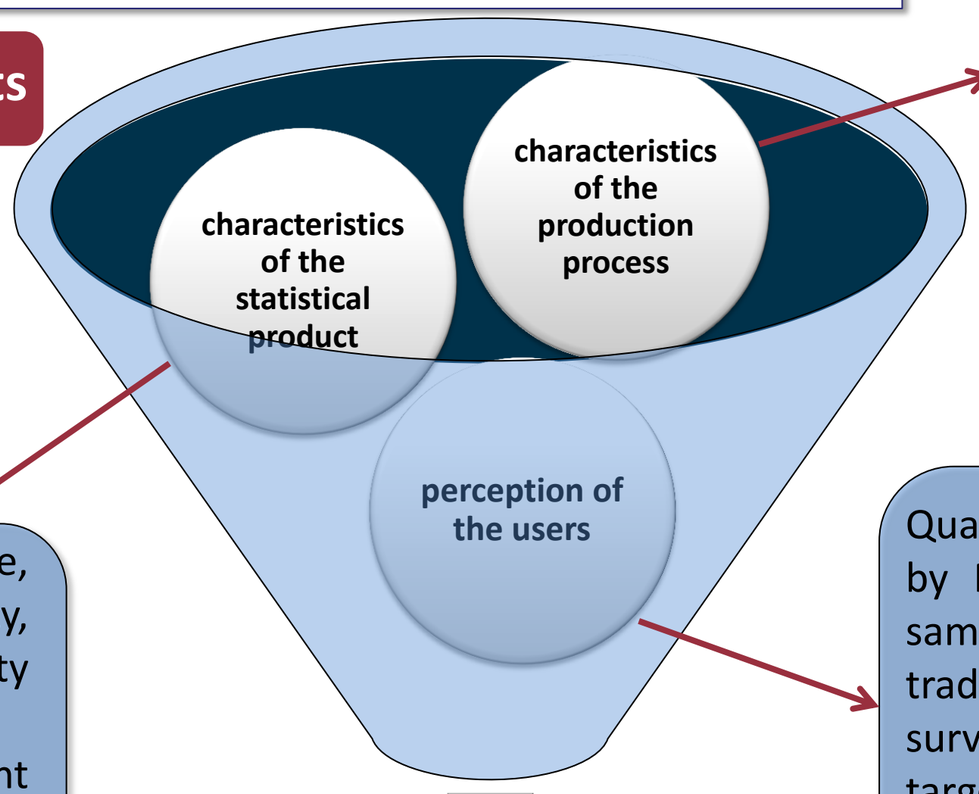
A simple proposal to outline quality for SPPIs focusing on the statistical product by choosing an appropriate set of key quality indicators

Data quality assessment elements

…according to 3 quality aspects



Six quality dimensions: Relevance, Accuracy, Timeliness and Punctuality, Comparability, Coherence, Accessibility and Clarity.
They provide users with important information on data and allow Eurostat to identify good practices.

Key process variables (resources/ time used, response rates, burden, complaints, error rates, interviewer performance, etc.): have the largest effect on product characteristics and vary by product quality component and type of process.

Quality is perceived differently by users and by NSIs, even if the components are the same. NSIs carry on several surveys: traditional users' surveys (known users); surveys of confidence (unknown users); target groups' specific surveys as well as reports production.

overall statistical data quality assessment

Key pilot quality indicators for SPPIs

1-identification of a set of appropriate key indicators to represent each of the quality dimensions described by Eurostat

2-normalization: transforming indicators into relative values

3-standardization: each indicator value*100

4-synthesis of indicators

Simple Arithmetic Mean: simplest way → different indicators are interchangeable and with same weight → but interchangeability of measures is more likely inside dimensions – outliers problem

Geometric Mean: small values are much more influential than the big ones → more sensitive to the variability of the components

Weighted Arithmetic Mean: advantage or disadvantage of considering indicators differently by assigning them weights → DECISION: the greater the distance from the target value (ideal), the more the indicator should weigh (the best indicator values has the smaller distance from it)

OBJECTIVE: to measure the overall quality over time for SPPIs

Quality dimension	Indicator	Formula
RELEVANCE	R1 - STS Regulation data completeness rate	n. SPPIs series produced/n.SPPIs series required by short term statistics (STS) Regulation
	R2 - Series length completeness rate	n. quarters produced/n.quarters required by short term statistics Regulation
ACCURACY	A1 - Un-weighted unit response rate	n. responding units in the sample/total n. units in the sample
	A2 - Weighted unit response rate	sum of turnover for responding units in the sample/total turnover of units in the sample
	A3 - Un-weighted item response rate	n. prices collected in the sample/total n. prices in the sample
TIMELINESS/ PUNCTUALITY	TP1 - Time lag final results	(release date of final results - last day reference period SPPIs)/ n.days in the quarter of dissemination
	TP2 - Punctuality – delivery and publication	|actual date of dissemination - scheduled date of dissemination|/n.days in the quarter of dissemination
ACCESSIBILITY/ CLARITY	AC1 - Number of publications disseminated	n. publications on SPPIs/n. publications on PPI
COMPARABILITY	C1 - Length of comparable time-series	n. comparable quarters for each serie/total n. comparable expected quarters all series
	C2 - Number of comparable time-series	n. comparable series produced/total n. comparable expected series

Pilot example and Results

✦ PILOT EXAMPLE: 2012-2016 SPPIs coming from direct surveys (17 indices)

✦ Annual averages of QIs values for each quarterly SPPI and for each year

✦HOW TO READ RESULTS: the increase in time of the value of quality indicators can be interpreted as an improvement in the quality of the statistics

✦ RESULTS: general improvement of the average quality over time (values increases). 2016: small decrease due to the interruption of the press release

✦ The three different methods give similar results indicating robustness in the measurements

Indicator	2012	2013	2014	2015	2016
R1	70.6	70.6	94.1	100.0	100.0
R2	70.6	70.6	91.2	100.0	100.0
A1	92.0	91.6	85.0	85.6	89.0
A2	91.8	91.8	90.2	92.1	93.7
A3	95.5	93.4	93.3	90.8	89.9
(100-TP1)	5.4	6.0	7.1	6.6	7.7
(100-TP2)	100.0	100.0	100.0	100.0	100.0
AC1	60.0	60.0	80.0	80.0	60.0
C1	70.6	70.6	86.8	100.0	100.0
C2	70.6	70.6	88.2	100.0	100.0

TYPE of SYNTHESIS	2012	2013	2014	2015	2016
Simple arithmetic mean	72.7	72.5	81.6	85.5	84.0
Geometric mean	60.4	60.9	69.6	72.1	71.4
Weighted arithmetic mean	79.8	79.8	90.7	91.3	85.3
% VARIATION VALUE	**2012**	**2013**	**2014**	**2015**	**2016**
Simple arithmetic mean	-	-0.3	12.6	4.8	-1.8
Geometric mean	-	0.8	14.3	3.6	-1.0
Weighted arithmetic mean	-	0.0	13.7	0.7	-6.6

SOME REMARKS

- overall good results for QIs values
- non-sampling Accuracy: A2 increases despite the slight decrease of A1; better results can be obtained for A3
- efforts should be done to improve TP1 results
- time variability of AC1 is high because it is calculated with few numbers

A lot of work needs to be done in identifying and estimating quality indicators for each quality dimension for short term statistics.

It would be desirable to have standardized periodical indicators included in the statistical production processes.

This pilot example is only an unpretentious attempt in this direction.