Community Innovation Survey 2008
Synthesis Quality Report

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1 Introduction

The present report is the synthesis of the national quality reports on CIS 2008 (version of 18th June 2012). It covers all aspects of quality as presented in the quality report template and makes an overall assessment of the quality of the 2008 data collection on innovation statistics.

CIS 2008 was carried out in 31 countries, i.e. the 27 EU Member States, 3 EU Candidate countries (Croatia, Iceland and Turkey) and Norway. Eurostat received 26 national quality reports, which are summarised in the present synthesis.

The report is organised as follows: chapter 2 gives a short methodological overview of the production of national CIS 2008 statistics. Chapter 3 makes an assessment of the quality of innovation statistics according to the quality dimensions defined by Eurostat. Chapter 4 presents a comparison of the CIS 2008 with the previous data collection, CIS 2006, highlighting the improvements made in the quality of CIS statistics. Finally, Chapter 5 summarises the findings of this synthesis report.

2 Methodological overview

The collection of the CIS statistics at national level is made following the Commission Regulation No. 1450/2004 implementing Decision No. 1608/2003 concerning the production and development of Community statistics on innovation. The regulation sets the variables to be collected, the activities and sectors to be covered and the breakdowns of the results. In addition, the methodological guidelines proposed by Eurostat provide specific information on the implementation of the CIS 2008, the data treatment and transmission to Eurostat.

As indicated thereon, the target population for the CIS 2008 was all enterprises in NACE Rev.2 sections A to M. The core population of NACE categories to be included in the survey on a mandatory basis was set according to annex IV of the Commission Regulation No. 973/2007.

Almost all countries covered the core population of NACE sections. In Poland the target population was according to NACE Rev.1.1 but the results were recalculated according to NACE 2 and thus, some industries in section E (NACE 36-39) may have been under covered.

Most of the countries covered in addition a number of NACE sections from the non-core activities. In particular, Spain, Latvia[1] and Malta covered all these sections and Czech Republic also covered them all with the exception of the non-core NACE 01-03, 59-60 and 75. More than half of the countries covered enterprises in "Scientific Research and Development" (NACE 72) and also one half of the countries covered enterprises in "Construction" (NACE 41-43). Finally, CIS in Spain, Latvia and Portugal also included some NACE divisions outside the recommended target population.

[1] Latvia covered enterprises in all NACE Rev.2 sections except for NACE U (Activities of extraterritorial organisations and bodies).

Table 1 shows the coverage of the additional NACE sections from the non-core population in the CIS 2008.

Table 1. Additional NACE sections covered in CIS 2008.

NACE sections in the non-core population	Number of countries	Countries covering this section
Scientific research and development (NACE 72)	17	Belgium, Bulgaria, Czech Republic, Germany, Spain, France, Latvia, Lithuania, Luxembourg, Hungary, Malta, Portugal, Romania, Slovakia, Sweden, Croatia, Norway
Construction (NACE 41-43)	13	Czech Republic, Spain, France, Italy, Latvia, Lithuania, Hungary, Malta, Netherlands, Portugal (not 41), Slovakia, Croatia, Norway
Wholesale and retail trade and repair of motor vehicles and motorcycles (NACE 45)	7	Czech Republic, Spain, France, Italy, Latvia, Lithuania, Malta
Retail trade, except of motor vehicles and motorcycles (NACE 47)	8	Czech Republic, Spain, France, Italy, Latvia, Lithuania, Malta, Portugal (47.1)
Legal and accounting activities (NACE 69)	8	Czech Republic, Germany, Spain, France, Latvia, Lithuania, Malta, Portugal
Activities of head offices; management consultancy activities (NACE 70)	8	Czech Republic, Germany, Spain, France, Latvia, Lithuania, Malta, Norway
Advertising and marketing research (NACE 73)	9	Czech Republic, Germany, Spain, France, Latvia, Lithuania, Malta, Portugal, Croatia
Other professional, scientific and technical activities (NACE 74)	9	Czech Republic, Germany, Spain, France, Latvia, Lithuania, Malta, Portugal, Norway (74.9)
Employment activities (NACE 78)	7	Czech Republic, Germany, Spain, France, Latvia, Malta, Netherlands
Security and investigation activities (NACE 80)	7	Czech Republic, Germany, Spain, France, Latvia, Malta, Netherlands
Services to buildings and landscape activities (NACE 81)	7	Czech Republic, Germany, Spain, France, Latvia, Malta, Netherlands
Real estate activities (NACE 68)	7	Czech Republic, Spain, France, Latvia, Malta, Netherlands, Croatia
Accommodation and food service activities (NACE 55-56)	8	Czech Republic, Spain, France, Italy, Latvia, Malta, Netherlands, Croatia
Rental and leasing activities (NACE 77)	6	Czech Republic, Spain, France, Latvia, Malta, Netherlands
Motion picture, video and television programme production, sound recording and music publishing / programming and broadcasting activities (NACE 59-60)	7	Germany, Spain, France, Latvia, Malta, Portugal, Norway
Agriculture, forestry and fishing (NACE 01-03)	5	Spain, Latvia, Malta, Netherlands, Norway (03)
Travel agency, tour operator and other reservation services and related activities (NACE 79)	7	Czech Republic, Germany, Spain, France, Latvia, Malta, Netherlands
Office administrative, office support and other business support activities (NACE 82)	7	Czech Republic, Germany, Spain, Latvia, Malta, Netherlands, Norway (82.9)
Veterinary activities (NACE 75)	4	Spain, Latvia, Malta, Portugal
NACE sections outside the recommended target population (NACE Rev. 2 A to M)		
Human health and social work activities (NACE 86-88)	3	Spain, Latvia, Portugal (86)
Arts, entertainment and recreation (NACE 90-93)	2	Spain, Latvia
Other service activities (NACE 94-96)	2	Spain (95, 96), Latvia

As regards the breakdown of enterprises into size classes, the Regulation defines the following three classes depending on the number of employees in the enterprise: (a) 10-49 employees, (b) 50-249 employees and (c) 250+ employees. The majority of countries were in compliance with this division. Some of them covered enterprises with more than 10 employees but used more detailed breakdowns than recommended. For example, Germany, Estonia and Netherlands broke down the class of 10-49 employees into two sub-groups, 10-19 and 20-49, and the class of 50-249 into 50-99 and 100-249 employees.

Germany and Norway also covered enterprises with 5 to 9 employees. Portugal reported that for NACE 86 only enterprises with 50 or more employees were included in the survey and for NACE sections 42, 43, 47.1, 59 and 60 only the enterprises with 250 or more employees. Sweden included all research institutes in the CIS sample regardless of their size.

In almost all countries the statistical unit in the CIS survey was the enterprise, as defined in the Council Regulation 696/1993 or in the national business register. Finland used the legal unit instead of the enterprise, as this was also the basic unit in the Finnish Business Register, or groups of legal units where most appropriate.

Finally, the observation and reference periods were in total compliance with the recommendations. Therefore, in all countries, CIS 2008 covered the observation period from 2006 to 2008 inclusive with reference period the year 2008.

Survey methodology

The majority of the countries used a combination of sample survey and complete enumeration (i.e. census) of the enterprises included in the frame population. Only two countries (Bulgaria and Malta) used exclusively census. In most of the cases where a combination of sampling with census is used, the employment size class is used to define a threshold. Usually larger enterprises are enumerated, while smaller enterprises are sampled. The threshold to separate large from smaller enterprises can be as large as 500 employees (for Germany only), for the majority of the countries it is 250 employees, for Hungary, the Netherlands and Romania it is 100 employees, while for several other countries (e.g. Estonia, Croatia, Norway, Poland, etc.) it is usually set to 50 employees, with the exception of Cyprus with 20 employees. Moreover, some countries implement census to previously known intensive R&D performers or to specific NACE groups/classes, irrespective of the size class.

Table 2 below gives an overview of the survey type, sample size, number of responses and population size. Moreover, the Table presents sample and response rates provided by the countries or computed based on the information available in the reports. During the analysis of these figures, as provided by the countries, it was realized that the sample size has caused some confusion. Clarifications on this issue will be given in future versions of the quality report templates. The information provided by all countries have been tried to put together in a comparable way. Therefore there is separate reporting of the gross from the net sample size, net sample representing the initial (gross) sample excluding the ineligible units. The net sample coincides with the term 'realized'/final sample used in the course of this quality report template.

Table 2. Overview of survey type and other sampling and response characteristics, CIS 2008.

	Survey type	Gross (initial) sample	Net (realised/ final) sample	Number of units with a response in the realised sample	Population size	Sample rate	Un-weighted Response rate
BE	Combination census/sampling	-	8599	3427	15111	56.91%	39.85%
BG	Census	-	-	13674	15832	-	86.37%
CZ	Combination census/sampling		8638	7295	49080	17.60%	84.45%
DE	Combination census/sampling	35197	29811	7661	225841	13.20%	25.70%
EE	Combination census/sampling		2479	2020	4923	50.36%	81.48%
IE	Combination census/sampling	4650		-	-	27.00%	-
ES	Combination census/sampling		48866	44652	205859	23.74%	91.38%
FR	Combination census/sampling	24986	15066	12260	89679	16.80%	81.38%
IT	Combination census/sampling	44803	38090	19904	208637	18.26%	52.26%
CY	Combination census/sampling	1365	1365	1365	-	-	100.00%
LV	Combination census/sampling		1707	-	13992	12.20%	-
LT	Combination census/sampling	2279	2143	2111	11279	19.00%	98.51%
LU	Combination census/sampling		692	615	1793	38.59%	88.87%
HU	Combination census/sampling	6363	6362	5390	20006	31.80%	84.72%
MT	Census	-	-	894	1288	-	69.41%
NL	Combination census/sampling	14624	14624	10981	58864	24.84%	75.09%
AT	Combination census/sampling	5402	5402	3534	15711	34.38%	65.42%
PL	Combination census/sampling	22152	21394	16013	54856	39.00%	74.85%
PT	Combination census/sampling	9116	7862	6512	25517	30.81%	82.83%
RO	Combination census/sampling	11689	10715	9506	31353	34.18%	88.72%
SI	Combination census/sampling	3009	3009	2595	4597	65.46%	86.24%
SK	Combination census/sampling	3239	2919	2296	10974	26.60%	78.66%
FI	Combination census/sampling	3576	3525	2622	8494	41.50%	74.38%
SE	Combination census/sampling	5418	5418	4624	17398	31.14%	85.35%
NO	Combination census/sampling	5114	5084	4892	14122	36.00%	96.22%
HR	Combination census/sampling	4504	4327	3404	10302	42.00%	78.67%

For the sampled enterprises most countries applied a stratified random sampling. The variables used for the stratification of the sample were the economic activity of the enterprise (according to NACE Rev.2 classification), the enterprise size and in few countries also the geographical region (NUTS2 level). The number of strata used for each variable varies among the countries. Regarding the size class, there were in most cases three strata based on the number of employees in the enterprise.

The majority of countries used the national business register as sampling frame, as it was also indicated in the methodological guidelines. The business register was up-to-date and provided information on identification characteristics of the enterprise, its economic activity and the number of employees.

Belgium, Germany, Spain and France used other registers for the selection of the enterprises. These registers were also used in other enterprise surveys, had a very good coverage of the enterprises and provided all the necessary information. Therefore, they may be considered statistically equivalent to the official business register.

Weights calculation method

Weights were calculated as the inverse of the sampling fraction, i.e. the ratio N_h/n_h, where N_h is the number of enterprises in stratum h of the population and n_h the number of enterprises in the sample in stratum h of the population, assuming that each enterprise had the same probability to be included in the sample. This ratio was used in order to adjust for different probabilities of selection of the enterprises in the sampling process.

Moreover in some countries, the initial weights were re-adjusted following the results of the non-response analysis and the information from auxiliary variables, like the number of employees, the number of enterprises and the turnover of the enterprise. The adjustment of weights was done in eleven countries with the use of a calibration method.

The data source used for the calculation of total figures in the population was the national business register. Most countries collected from the register information on the number of enterprises, broken down by economic activity and size class. Other variables derived were the number of employees, the turnover of the enterprises and the geographical regions.

Countries used various programmes for the weighting of CIS data. The most commonly used were the software package CLAN, SAS programmes (usually self-developed), SPSS, STATA, MS Access and MS Excel.

Data collection and transmission

CIS 2008 data were collected either through a postal or an electronic survey. In fact, the majority of countries offered both possibilities to the enterprises. The CIS questionnaire was first sent by post. Enterprises that wanted to reply electronically could either fill in the electronic questionnaire available on the website of the NSI, and send it back by mail, or reply to a web-based platform, specially developed for the CIS. The electronic mode was rather preferable by the enterprises in Estonia, Norway and Italy.

Only in two countries, Cyprus and Luxembourg, the CIS data collection was made exclusively via face-to-face interviews at the enterprises' premises. Romania also made visits to the enterprises apart from the postal survey.

Finally, some countries also contacted the enterprises by telephone. This mode served at first as a reminder for replying to the survey and secondly as a follow-up to clarify non-responses and missing data.

Table 3 summarises the data collection methods used in CIS 2008.

Table 3. CIS 2008 Data Collection Methods

CIS 2008 Data Collection Method	Number of countries	Countries
Postal and Electronic Survey	16	Belgium, Bulgaria, Germany, Estonia, Ireland, Spain, France, Hungary, Latvia, Lithuania, Austria, Portugal, Finland, Sweden, Croatia, Norway
Only Postal Survey	6	Czech Republic, Malta, Netherlands, Romania, Slovenia, Slovakia
Only Electronic Survey	2	Italy, Poland
Face-to-Face Interviews	3	Cyprus, Luxembourg, Romania

As regards the transmission of CIS data to Eurostat, all countries used the EDAMIS (electronic Data files Administration and Management Information System) application as recommended in the methodological guidelines.

Overall assessment of the national methodology

In this section countries were asked to give an overall assessment of the quality of the CIS methodology. Most countries considered it to be good with respect to the standard criteria of quality mainly thanks to the common tools adopted (harmonised methodology and questionnaire). Most critical weaknesses can be traced back to non-evident concepts of innovation and innovation activities and their interpretation to and by the respondents in the survey.

The main strengths and weaknesses of CIS 2008, as reported by the countries in the national quality reports are summarised as follows:

<u>Strengths</u>

- Survey methodology according to Eurostat methodological recommendations resulting in reasonable good comparability over countries
- Common questionnaire and methodological recommendations with CIS 2006 resulting in high comparability over time
- Mandatory nature of the survey, where applicable, resulting in reasonable good quality
- Complete enumeration of large enterprises in each round resulting in good familiarity with the CIS questionnaire and the survey concepts
- High unit response rate in census and sample surveys – no need for non-response survey in most countries
- Low item non-response rates, especially for the main questions of the survey, thanks to re-contact with enterprises for corrections/completions on the data initially received
- Electronic mode of data collection – convenient for respondents, economical form of collecting data, data control during fulfilling questionnaires
- Electronic and manual data checking
- On-line manual and phone lines available to help respondents filling in the questionnaire
- All compulsory cells in the CIS tabulation delivered

- All national tabulated data and micro-data delivered on time
- No significant differences with SBS data for 2008 resulting in high coherence

Weaknesses

- In several cases enterprises cannot necessarily assess with precision whether their own activities are innovative or not, and this is more evident with the expansion of the concept to marketing and organisational innovations in CIS 2008
- Difficult for enterprises in the services sector to fill in the questionnaire as the wording of questions appear more applicable to enterprises in manufacturing – more apparent in NACE46, wholesale trade, where many respondents thought that the survey was not relevant for them
- High burden on respondents due to the length of the CIS questionnaire and the complexity of the requested information
- Lack of knowledge about innovation and research and lack of resources to spend in filling in such a long questionnaire
- High non-response rate for questions on innovation expenditure either due to data confidentiality or due to the difficult and time-consuming data collection, especially for large enterprises
- High non-response for questions on turnover of innovative products due to the difficulty in understanding the concept
- With regard to R&D data:
  - Broadly fit with the latest results from R&D surveys but show differences on a micro-level
  - Difficulties in the grossing up of R&D expenditures
  - Number of R&D performing enterprises overestimated in a sample survey as the CIS
- Editing phase still a burdensome
- Timing of the survey relatively late
- No user satisfaction survey carried out

Plans for further improvements (*reported only by few countries*):

- Refinement of the estimates for non-respondents
- Carrying out of user satisfaction survey
- Gathering of reliable information on the burden of respondents
- Development of the editing process to be more efficient in future rounds
- Regional stratification (NUTS 1, 2 or 3) – depending on the expected increase of the sample size

3 Quality assessment

This chapter includes an overall assessment of the quality of the 2008 Community Innovation Survey (CIS 2008). It uses the six[2] following dimensions of quality as defined in the Eurostat standard statistical quality framework:

1. Relevance: it is the degree to which statistics meet current and potential users' needs. It includes the production of all needed statistics and the extent to which concepts used (definitions, classifications etc.) reflect user needs.
2. Accuracy: it denotes the closeness of computations or estimates to the exact or true values.
3. Timeliness and punctuality: they refer to time and dates, but in a different manner: the timeliness of statistics reflects the length of time between their availability and the event or phenomenon they describe. Punctuality refers to the time lag between the release date of the data and the target date on which they should have been delivered, with reference to dates announced in the official release calendar.
4. Accessibility and clarity: they refer to the simplicity and ease for users to access statistics using simple and user-friendly procedures, obtaining them in an expected form and within an acceptable time period, with the appropriate user information and assistance.
5. Comparability: it aims at measuring the impact of differences in applied statistical concepts and definitions on the comparison of statistics between geographical areas, non-geographical domains or over time. It is the extent to which differences between statistics are attributable to differences between the true values of the statistical characteristics.
6. Coherence: the extent to which statistics are in agreement with relevant or related statistics originating from different statistical procedures.

3.1 Relevance

3.1.1 User groups, user needs, user satisfaction

The proposed classification of users of innovation statistics that falls into the following groups:

1. Institutions
2. Social actors (e.g. Employers' associations, trade unions, lobbies etc),
3. Media
4. Researchers and students
5. Enterprises or businesses

conforms with the situation in each country. The main institutions at European level are DG ENTR, where data are used for the European Innovation Scoreboard, and Eurostat that uses CIS data for the compilation of EU aggregates and the dissemination of statistics to users. At international level, OECD uses CIS data for international comparisons and further analyses on innovation of enterprises. Users of CIS statistics are

[2] "Cost and burden" is omitted from the present synthesis report for reasons of confidentiality.

also various national Ministries and other government institutions that need CIS statistics for the monitoring of innovation strategies, the production of national indicators and reports and the further development in the field of innovation.

Other users of CIS statistics are research institutes, researchers and students. Such users are interested in CIS data for analytical purposes, for research in science and innovation and its performance in enterprises and for studies in economics and other relevant topics.

Enterprises and other businesses are using CIS data for comparisons of innovation strategies and for market analyses. Finally, media are also an important user of CIS statistics for the presentation of innovation activities to the general public.

A user satisfaction survey is not generally carried out. Three countries report that they consider that users are satisfied with the available information on innovation. Austria conducts a user satisfaction survey in common for R&D and Innovation. Luxembourg reports that they involve users in the preparation of the national questionnaire, which leads to the inclusion of some of their needs in the survey. Norway also reports that they hold regular meetings with key stakeholders where participants express their suggestions for changes in future collection rounds.

3.1.2 Completeness

The Commission Regulation N° 1450/2004, implementing Decision No 1608/2003/EC of the European Parliament and of the Council concerning the production and development of Community statistics on innovation (= Commission Regulation on innovation statistics), puts innovation statistics on a statutory basis and makes compulsory the delivery of certain variables.

According to article 5 of the Com. Reg. 1450/2004, two types of data are to be transmitted to Eurostat. The first set of data refers to aggregated statistics that will be transmitted on a compulsory basis while the second one refers to individual data records that could be transmitted on a voluntary basis. Eurostat has furthermore prepared detailed guidelines for the tabulation of the transmitted data (by detailing the derivations step-by-step based on the survey microdata).

For the assessment of the completeness of national statistics the comparison has been done on the total number of compulsory cells which should be transmitted to Eurostat with the number of cells actually transmitted for the total number of cells in all Excel tables[3] that were transmitted with reference year 2008. Reference has not been made to the completeness of voluntary cells.

Based on the information that countries have provided in their national quality report, all countries transmitted the compulsory cells excepting two countries (Belgium and France). Belgium clarifies that the reason why some compulsory cells are missing is because no observations were available for these cells (either because there is no firm in the population, or because none of the surveyed firms answered the questionnaire).

[3] INN_BASIC1, INN_BASIC2, INN_GEN, INN_GEN2, INN_ENTER, INN_ENTER2, INN_TYPES, INN_DEVELOP, INN_DEVELOP_RD, INN_NEWPROD, INN_EXPEND, INN_FUNDING, INN_SOURCES, INN_COOP, INN_OBJECT, INN_ORGMKT, INN_ORG-type, INN_OBJORG, INN_MKT-type, INN_OBJMKT, INN_ECO, INN_ECOMOT, INN_ECOPRO

3.2 Accuracy

Accuracy of statistics is the outcome of many factors which makes very difficult its quantification with precision. In this quality report an indirect assessment is done and information on sampling and non-sampling errors which affect CIS statistics are presented.

3.2.1 Sampling errors

The coefficients of variation (CV) for five key indicators:

i. percentage of innovating enterprises

ii. percentage of innovators that introduced new or improved products to the market

iii. turnover of new or improved products, as a percentage of total turnover

iv. percentage of innovation active enterprises involved in innovation cooperation

v. total turnover per employee

as reported by countries which rely more on sampling are shown in Table 4 and Figure 1.

The coefficients of variation are quite large in few countries and for specific variables. Figure 1 looks the coefficients of variation in parallel to sample rates. What could be expected is small sample rates to be linked to large coefficients of variation, which is however evident in few cases only (e.g. for Latvia).

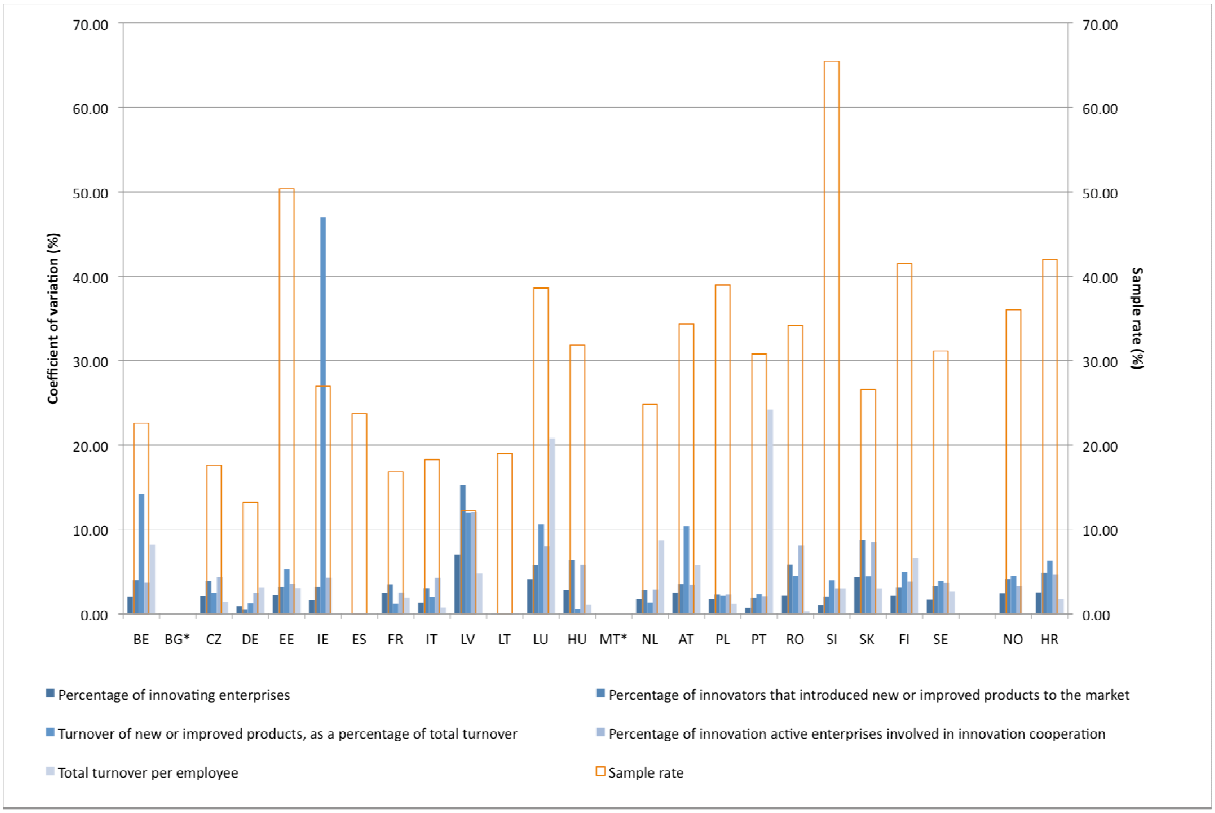
Table 4. CIS statistics, 2008. Coefficient of variation for five key indicators

	Percentage of innovating enterprises	Percentage of innovators that introduced new or improved products to the market	Turnover of new or improved products, as a percentage of total turnover	Percentage of innovation active enterprises involved in innovation cooperation	Total turnover per employee
BE	2.00	4.01	14.21	3.71	8.23
CZ	2.07	3.85	2.45	4.29	1.42
DE	0.90	0.52	1.26	2.43	3.09
EE	2.20	3.14	5.26	3.52	3.03
IE	1.55	3.14	46.97	4.23	-
ES	-	-	-	-	-
FR	2.45	3.45	1.21	2.53	1.91
IT	1.29	3.02	1.98	4.22	0.78
CY	88.50	120.80	255.60	97.30	212.70
LV	6.98	15.26	11.95	12.01	4.80
LT	6,20	8,10	7,20	4,70	5,50
LU	4.09	5.76	10.57	8.00	20.83
HU	2.83	6.40	0.56	5.81	1.03
NL	1.80	2.80	1.30	2.90	8.70
AT	2.52	3.48	10.40	3.41	5.75
PL	1.80	2.30	2.10	2.30	1.20
PT	0.75	1.90	2.33	2.04	24.21
RO	2.11	5.83	4.51	8.07	0.27
SI	1.00	2.00	4.00	3.00	3.00
SK	4.33	8.79	4.45	8.46	3.00
FI	2.10	3.10	5.00	3.80	6.60

	Percentage of innovating enterprises	Percentage of innovators that introduced new or improved products to the market	Turnover of new or improved products, as a percentage of total turnover	Percentage of innovation active enterprises involved in innovation cooperation	Total turnover per employee
SE	1.67	3.27	3.92	3.68	2.65
NO	2.40	4.10	4.50	3.30	-
HR	2.54	4.84	6.27	4.69	1.79

Note: Figures have been rounded to 2 decimal digits. Countries not reported on the table (i.e. BG and MT) carried out a census.

Figure 1. CIS statistics, 2008. Coefficient of variation for five key indicators and sample rates (%)



Note: Asterisks indicate countries that conducted census. Figures from CY are still under discussion and are, thus, not presented in this graph,

For the estimation of variance, most countries used a SAS procedure taking into account the sampling design and the overall weighting. The variance was calculated using the formula given in Annex 10.1 of the CIS quality report template.

3.2.2 Coverage errors

Coverage errors are quite few in CIS 2008. This is due to the fact that most countries used the official business register as sampling frame, which is considered up-to-date and of high quality. Any errors reported mainly arise from over-coverage due to the inclusion of out-of-scope units or units that do not longer exist in the frame population.

As regards the effect of coverage errors in the CVs reported in Table 4, almost all countries did not incorporate these errors in the calculation of CVs. Exceptions were seven countries, i.e. Czech Republic, Estonia, Italy, Latvia, Lithuania, Hungary and Slovakia.

Misclassification rates

Countries were asked to provide the misclassification rates of their frames, i.e. the percentage of enterprises that were found to belong in a different stratum than indicated by the frame. These are given in Table 5.

Please note that for the calculation of the misclassification rates countries followed different procedures. However, since rates are expressed as percentages, figures may still be used for comparison reasons. Italy, Malta and Hungary reported the largest misclassification rates (28.1%, 16% and 14.56% respectively) while Austria, Bulgaria, Cyprus and Sweden reported no deviations in the allocation of enterprises in the strata between the time of the last frame update and the time when the survey was carried out.

Misclassification rates were calculated either based on the size of the initial (gross) sample, or the number of units with a response in the realised sample. In exceptional cases, figures are based on the realised (final/net) sample (or complete enumeration where relevant), while for many countries no inference is made about the approach. In Table 5 an indication is given according to which approach the calculation of the misclassification rate has been made.

Table 5. 'Frame' misclassification rate (%) by size class in CIS 2008.

	Small [10-49]	Medium [50-249]	Large [>249]	TOTAL
BE**	10.20	6.90	5.00	8.80
BG*	0.00	0.00	0.00	0.00
CZ	12.50	6.40	4.50	11.10
DE*	11.40	8.80	6.80	10.20
EE***	0.01	0.04	0.08	0.02
IE	-	-	-	-
ES	7.64	23.62	12.99	9.78
FR	1.32	1.14	0.87	1.19
IT*	29.90	25.10	16.80	28.10
CY*	0.00	0.00	0.00	0.00
LV***	10.63	8.85	1.56	9.20
LT*	0.21	6.88	8.35	4.43
LU	-	-	-	-
HU**	18.39	10.24	9.80	14.56
MT	15.00	20.00	14.00	16.00
NL	-	-	-	-
AT*	0.00	0.00	0.00	0.00
PL	0.06	0.03	0.02	0.04
PT**	6.80	9.80	9.00	7.80
RO	1.58	1.08	0.21	1.18
SI	-	-	-	-
SK**	5.10	9.50	3.60	6.20
FI	-	-	-	-
SE*	0.00	0.00	0.00	0.00
NO	-	-	-	-
HR**	3.08	7.16	7.95	5.26

*Rates based on the initial (gross) sample

**Rates based on the units with a response in the realised sample

***Rates based on the realized (final/net) sample

3.2.3 Measurement errors

Measurement errors occur during data collection and cause recorded values of variables to be different from the true ones. Such errors are usually caused by the survey questionnaire or/and the respondents. Countries were asked to provide a short description of measurement errors, if existing, and the measures taken at national level to reduce them.

The majority of countries did not report any measurement errors. There were only some problems mentioned by few countries concerning data for turnover and innovation expenditures. In particular, Czech Republic reported that many enterprises found it difficult to estimate the percentages of total turnover from new products or services (question 2.3 of the CIS 2008 questionnaire).

All countries made significant efforts to minimise measurement errors. At first, they organised seminars for the training of the persons involved in the data collection and most of them tested the survey questionnaire before sending it to the enterprises. They also prepared explanatory notes for both the postal and the electronic survey in order to help respondents in the completion of the questionnaire.

The use of the electronic questionnaire by many countries had a positive impact on the quality of the data collected. This mode allowed the use of built-in controls that checked the values inserted by respondents at the time of completion and informed them in case of error or missing item. The electronic version also eliminated the bias from interviewers.

3.2.4 Processing errors

Processing errors are considered to be negligible in the CIS 2008 data collection. In case of a postal survey, data were entered through a data keying method and any error was corrected manually during the editing process. A number of quality checks were then applied in order to identify inconsistent or missing information. These checks also included comparisons with data from previous surveys or data from structural statistics to assess the consistency of the data collected. Finally, countries contacted the enterprises, mainly by phone, in order to request clarifications on the answers received and complete items that were left empty.

3.2.5 Non-response errors

Non response occurs when a survey fails to collect data on all survey variables from all the population units designated for data collection in a sample or complete enumeration.

Non-response errors may be reduced with the use of reminders/recalls to the enterprises. As recommended in the survey guidelines, most countries sent at least two or three paper reminders to non-responding enterprises. Additionally, these enterprises were either contacted by phone or e-mail in order to remind them to fill in and deliver the survey questionnaire.

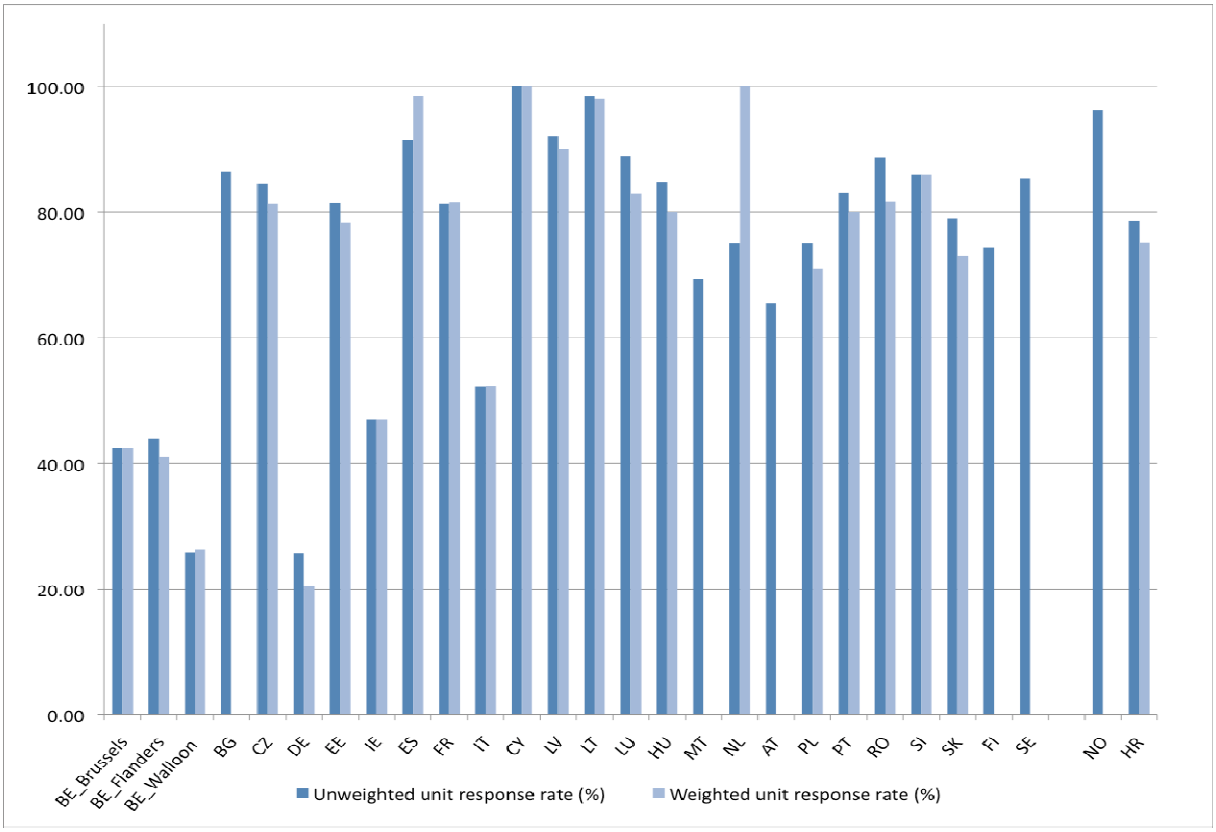
Figure 2 presents un-weighted and weighted unit response rates, defined as follows:

- Un-weighted Unit Response Rate= 100*(Number of units with a response) / (Total number of eligible and unknown eligibility units in the sample)
- Weighted Unit Response Rate = 100*(Weighted number of responding units) / (Weighted number of eligible and unknown eligibility units in the sample)

The weighting is with the same weights used for estimation of population statistics with sample data. Therefore the weighted response rate is an estimate of the proportion of population units which would respond, had a census been used. When a country uses a census (BG and MT) un-weighted and weighted response rates coincide.

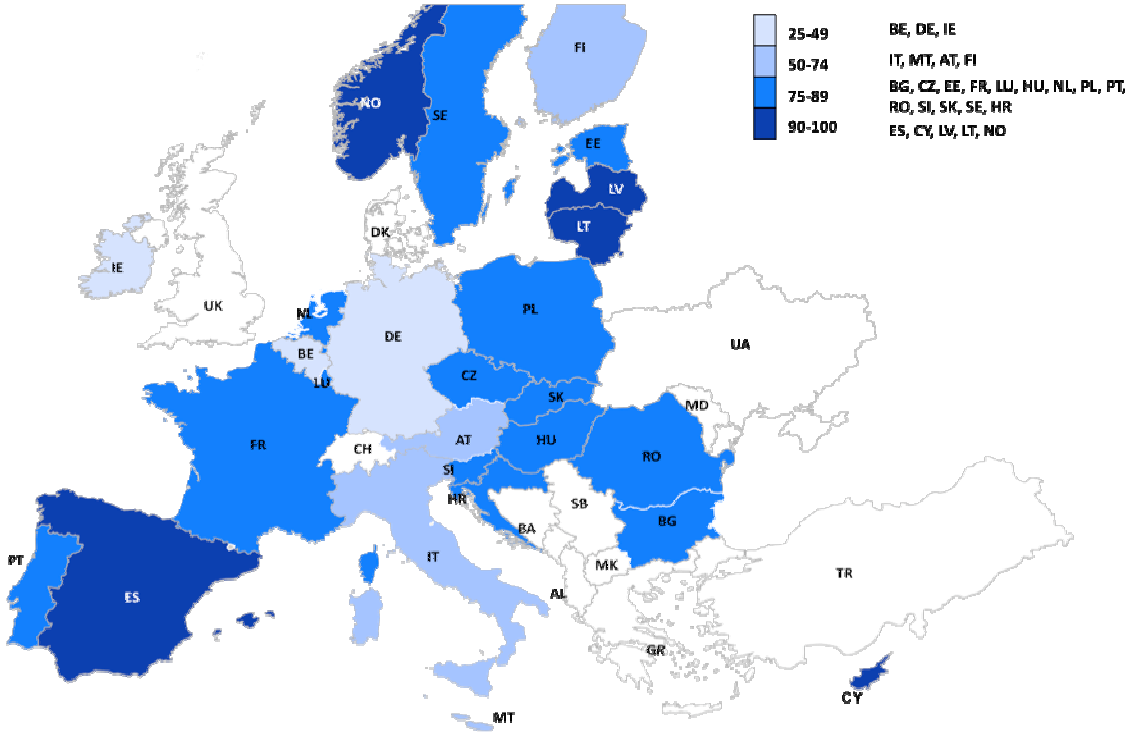
Figure 2 shows both rates for each country, unless a census is used in which case only the un-weighted rate is shown. Overall non-response is evident in the CIS surveys of several countries. In particular it can be seen that all the three Belgium regions and Germany have response rates below 50%, while sixteen countries have response rates above 80%. Belgium reported that the non-mandatory participation in the CIS survey may be an explanation for the low response rate.

Figure 2 CIS statistics, 2008. Unit response rate (%).



The un-weighted response rates are also shown on a map of Europe, in Figure 3 below.

Figure 3. CIS statistics, 2008. Un-weighted unit response rate (%).



Following Eurostat's recommendations for the CIS 2008, a non-response survey should be performed when the (un-weighted) unit response rate is below 70%. As shown in Figure 2, Belgium, Germany, Austria, Ireland and Italy reported response rates below this threshold. The first three[4] carried out a non-response analysis to overcome the effect of the low response rate on the data collected. Italy planned to perform such a survey but due to delays caused by administrative issues, this did not start in time for the provision of CIS 2008 estimates.

The non-response survey was performed for a stratified random sample of enterprises selected from the non-responding units of the full survey. In Belgium, this sample included only small and medium enterprises from the core NACE sectors since the response rate for large enterprises was more than 70%. Austria selected two "mirror" units from the same stratum for each sampled enterprise in case the original enterprise would refuse to participate. The final sample included 42% of the original selected enterprises and 58% of the first or second mirror units.

Enterprises were contacted by phone. Germany used the CATI method while Belgium and Austria provided also the possibility to the enterprises to reply either by fax or e-mail. The questions included in the non-response survey were similar to those specified in Annex 5 of the CIS 2008 methodological recommendations. All three countries achieved high response rates that allowed data from the non-response survey to be used in the adjustment of weighting factors for the share of innovative enterprises in the CIS 2008. The overall response rates in the non-response survey were 88% in Belgium, 82% in Germany and 99.5% in Austria.

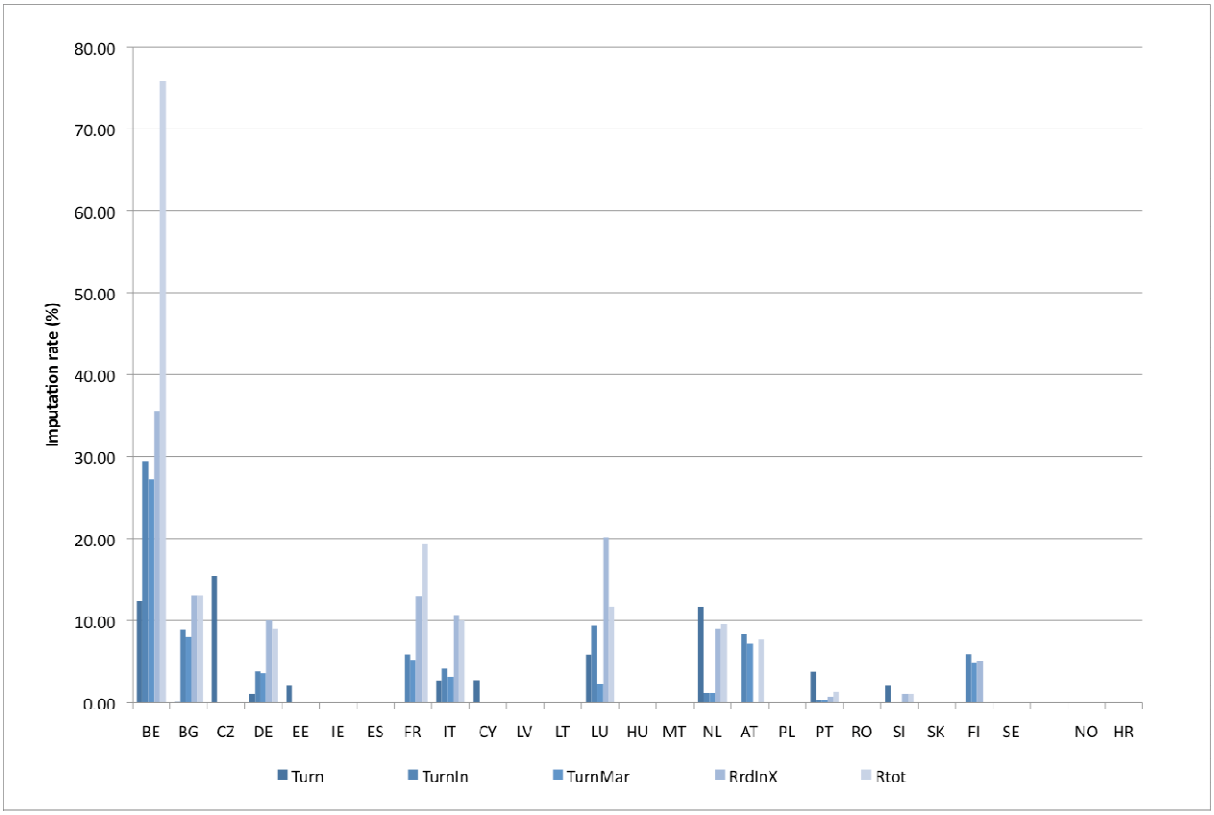
[4] In Belgium, a non-response survey was performed only for Flanders.

Use of imputation

National authorities try to correct errors in the data by re-contacting the enterprises concerned. Only if this is not possible do they resort to imputation for (automatic) correction. The imputation rates, i.e. proportion of enterprises for which imputation was used, for five metric CIS indicators (i.e. Turn = Total turnover in 2008, Turnin = Turnover due to new or improved product (Share), TurnMar = Share of new or improved products to market, RrdInX = Expenditure in intramural RD, Rtot = Total innovation expenditure) are shown in Figure 4.

Belgium has reported considerably high imputation rates. Especially for total innovation expenditure imputation rate exceeds 75%. High imputation rates for Belgium are reasonable as a result of low response rate (approximately 37% on average for the three regions) to some extent but mainly due to the fact that Rtot was fully imputed in Flanders (as the sum of its components). France and Luxembourg have also reported high imputation rates, close to 20%, for total innovation expenditure and Expenditure in intramural R&D respectively. Both countries report response rates above 80%.

Figure 4. CIS statistics, 2008. Imputation rates (%) for five key indicators.



3.3 Timeliness and Punctuality

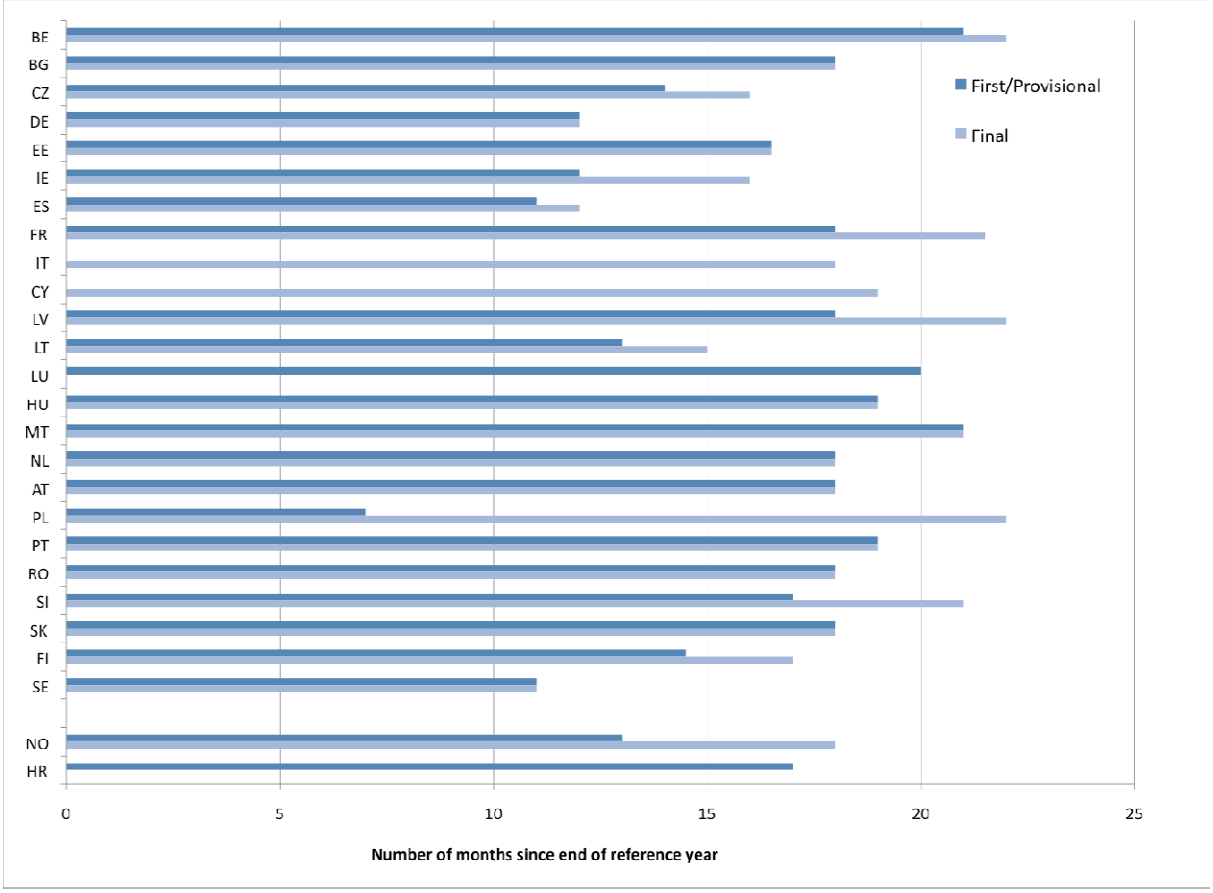
According to Com. Reg. 1450/2004 national CIS statistics must be delivered to Eurostat within 18 months from the end of the reference year, i.e. the deadline for transmission of 2008 CIS data to Eurostat being 30th June 2010.

Most countries conformed to this regulation and sent their results within the required time period. Deviations have been reported only by Luxembourg (2 months delay) and Malta (half month delay) only. Greece has not sent the data. Croatia, Ireland, Lithuania and Sweden manage to compile and send their data half, one or two months in advance of the deadline.

Timeliness reflects the length of time between the availability of the statistics and the event or phenomenon they describe. Figure 5 below shows the number of months since the end of 2008 which passed until preliminary and final results for 2008 were released.

A number of countries manage to have final results available at the time when national first/provisional data are due. Moreover, Sweden, Finland, Spain, Estonia, Germany and Czech Republic release both first/provisional and final figures earlier than the T+18 deadline for transmission of data to Eurostat.

Figure 5. National first and/or provisional and final results for CIS statistics, 2008. Number of months after the end of 2008 before the release of the statistics.



3.4 Accessibility and Clarity

Accessibility is evaluated through the different means used by the countries for the dissemination of the CIS statistics to users. Table 6 shows the available means in the CIS 2008, the level of access (free/paid) and the countries that provided each mean of dissemination.

We mention that the majority of countries publish the CIS results on their website. In addition, more than half of the countries publish a press release with the main results and indicators and various paper publications. An on-line database of all or part of the survey data is also available to users. Only four countries disseminate CIS micro-data, either free of charge or under payment.

Table 6. Means of dissemination of CIS 2008 statistics.

Mean of dissemination	Level of access	Number of countries	Countries
Paper publication	Free of charge	15	Belgium, Germany, Estonia, Ireland, France, Italy, Cyprus, Lithuania, Luxembourg, Netherlands, Romania, Slovenia, Slovakia, Norway and Croatia
	Paid	6	Czech Republic, Cyprus, Latvia, Austria, Romania, Slovakia
On-line database	Free of charge	17	Belgium, Germany, Estonia, Ireland, Spain, France, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Romania, Slovenia, Slovakia, Sweden and Norway
Website	Free of charge	22	Belgium, Bulgaria, Czech Republic, Germany, Estonia, Ireland, Spain, France, Cyprus, Lithuania, Luxembourg, Hungary, Netherlands, Austria, Poland, Portugal, Slovenia, Slovakia, Finland, Sweden, Norway and Croatia
CD-ROM	Free of charge	2	Portugal, Romania
	Paid	4	Czech Republic, Poland, Spain, Austria
Press release	Free of charge	16	Bulgaria, Germany, Estonia, Spain, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Austria, Poland, Romania, Finland, Sweden, Norway
Anonymised micro-data (for research)	Free of charge	2	Germany, Italy (password required)
	Paid	3	Netherlands, Norway, Slovakia

Data are usually accompanied by comprehensive methodological notes that provide information on the scope of the survey, the related concepts and definitions and the data collection method. In addition, many countries provide also guidelines to users for the interpretation of the indicators published. The feedback received from users on the clarity of CIS statistics is considered positive.

3.5 Comparability

In this section the assessment on the comparability of national CIS 2008 statistics has been made. There is a split into two sections, i.e. deviations from methodological recommendations and comparability over time, in line with the template of the quality reports.

3.5.1 Methodological deviations

Com. Reg. 1450/2004 provides detailed recommendations about the compilation of innovation statistics which can be considered as an international reference work in this domain. Moreover it provides in accordance with the Oslo Manual, those harmonised concepts and definitions that Member States should apply for the statistics to be compiled.

Table 7 presents key concepts and the number of countries that adopt the recommendation. When the recommendation is not adopted the respective national practices are also presented.

Table 7. CIS statistics, 2008. Agreement of national concepts with Oslo Manual and Com. Reg. 1450/2004 recommendations.

CONCEPT / ISSUE	No of countries adopting the recommendation	No of countries with minor deviation from the recommendation	Countries with minor deviations	Comments on deviations
QUESTIONNAIRE				
Deviation from the harmonised CIS 2008 questionnaire	13	13	BE - CZ - DE - EE - ES - FR - IT - LU - NL - PL - PT - SK - SE	**BE:** Very slight deviation in the order of the questions: we grouped the General information' question (question 1) with the 'economic information' question (question 11) in a 'Module A: General information' question. This should really not impact the results. **CZ:** The variable ENVID does not cover answer: 3: Yes for both before and after January 2006 **DE:** The German CIS 2008 questionnaire contained a number of additional questions that are not part of the harmonised CIS 2008 (see English translation of the questionnaire sent to Eurostat). **EE:** Few national questions incorporated into core questionnaire, some additional categories used (as CIS in question 1.2). No whatsoever impact **ES:** (Q 5.1) Innovation activities are requested for 2008 only and not for the period 2006-2008 (Q 5.2) Total innovation expenditure includes also Training, Market introduction of innovations and Other preparations expenditures, and "Module on Eco-Innovation" not implemented. Alternative items are included in the questionnaire as indicated in the Model questionnaire **FR:** 6 different questionnaires specific to each sector of activity (transport, trade, industry, services, finance and construction) were proposed, with a vocabulary adapted according the activity. Consequently, some deviations from the harmonised CIS2008 questionnaire were present: In question 2.1, the sub-question noticed INPDGD was not asked in the questionnaires associated to the sectors of finance and transport. In question 9.1, the sub-question noticed MKTPDL was not asked to companies belonging to the trade sector.

CONCEPT / ISSUE	No of countries adopting the recommendation	No of countries with minor deviation from the recommendation	Countries with minor deviations	Comments on deviations
				In question 10, the sub-question noticed ECOREA was not asked to companies belonging to the sectors of transport and finance. In question 3.3, the item "does not know" did not exist in any questionnaire. Question 11 about enterprise's total turnover and number of employees was not asked in the French questionnaire. External sources were used to get these information. Other differences are additional French questions. The impact of these deviations is weak. **IT:** We asked for the other innovation expenditures (training, design and marketing). **LU:** A module on knowledge management was included. This follows after the CIS questions. R&D data were collected via an additional module. This also follows after the CIS questions. Some additional questions were introduced in the core of the CIS questionnaire. These questions deal with: competition context on firm's market (for innovating or not innovating firms), results of process innovation, effects of economic downturn on planned innovation activities, usage of strategic protection methods (in addition to intellectual property rights) **NL:** To the harmonised questionnaire we added: - a question on the number of R&D-personnel; - a question on intellectual property; - a few extra categories of objectives and sources; - a question on biotechnology; - a question on the amount of R&D financing; Question 3.3 from the harmonised questionnaire ('Were any of your process innovations introduced between 2006 and 2008 new to your market?') was not included. Some instructions in questions 5.1 and 5.2 of the harmonised questionnaire were not included. Question 5.3 of the harmonised questionnaire refers to financial support for innovation activities. Our national questionnaire refers only to R&D activities. In the question on 'Environmental benefits from the production of goods or services within your enterprise' the words "noise pollution" were not included in the category 'Reduced soil, water, noise or air pollution'. **PL:** The impact is not significant

CONCEPT / ISSUE	No of countries adopting the recommendation	No of countries with minor deviation from the recommendation	Countries with minor deviations	Comments on deviations
				PT: We introduced some national questions. No impact expected, due to the optional status of those questions **SK:** Q1.1 (voluntary) without reference year (2008), we guess that enterprises answered this question for the year 2008, because the reference year was written in the title of the questionnaire Q10.2 (voluntary) in first two options is not written reason "taxes" due to not existing such taxes in our country **SE:** All mandatory questions according to the regulation were included in the Swedish questionnaire. We also included almost all the voluntary questions. The only questions that we did not include from the "core" questionnaire was question nr 3.3, 5.3 and 6.1
National data collection period	26	-		
Deviation from the sampling frame	24	2	SE - NO	**SE:** All research institutes (regardless of size) are also included in the sample **NO:** Enterprises with 10-19 employees not covered in NACE 49-53
TARGET POPULATION (1)				
NACE sectors covered[5]	21	5	ES – LV – PL – PT – FI	**ES - LV:** Coverage of sectors outside the recommended target population - Human health and social work activities (NACE 86-88), Arts, entertainment and recreation (NACE 90-93), Repair of computers and personal and household goods, and Other personal service activities (NACE 95, 96) **PL:** Target population for CIS 2008 in Poland was according to NACE Rev1. The results were recalculated according to NACE 2. Some industries in section E (NACE 36-39) could be under covered **PT:** Coverage of sectors outside the recommended target population – NACE 86

[5] The deviations indicated in the coverage of NACE sectors refer to differences in the NACE classification, the non-coverage of sectors in the core population and the coverage of sectors outside the recommended target population. For the coverage of the additional NACE sectors, apart from the core population, please see Table 1 of the present synthesis report.

CONCEPT / ISSUE	No of countries adopting the recommendation	No of countries with minor deviation from the recommendation	Countries with minor deviations	Comments on deviations
Size classes	23	3	DE - ES - NO	**DE:** extended for size class 5 to 9 employees **ES:** The breakdown of the size classes used for extracting the random sample from the Target Population is the following: o 10-49 o 50-199 o 200-more (all covered) **NO:** Enterprises with 10-19 employees not covered in NACE 49-53
SURVEY METHODOLOGY				
SAMPLING FRAME				
Sampling frame	22	4	BE – DE – ES - FR	**BE:** Due to confidentiality constraints the official Belgian business register could not be used. Instead, we used as frame population the register available from the Belgian National Social Security Office that contains all active employers in Belgium. This official register is at the enterprise level. We used its December 2008 version. This register was agreed upon by Statistics Belgium as being statistically equivalent to the official business register. **DE:** In the absence of a publically accessible national business register in Germany for purposes of sampling, we used the enterprise register of Creditreform, the largest credit rating agency in Germany, which was processed by ZEW in order to serve as an appropriate sampling comparable to official business registers. **ES:** The Central Businesses Directory (DIRCE) and the Directory of Enterprises that performed R&D or are potential R&D performers (DIRID) are used. Both frames are annually updated. **FR:** The frame was built mainly from the frame of the annual sectoral survey (ESA) and the annual production survey (EAP 2008). For sectors not surveyed by the ESA, the French business register SIRENE was used.
Date of business register extraction	23	3	FR - IT - SE	**FR:** Sampling was realised in June 2009, and concerned enterprises active at the date of the extraction **IT:** Information dated 31 Dec 2006 **SE:** Nov 2008
DATA COLLECTION				
Survey method	26	-		

CONCEPT / ISSUE	No of countries adopting the recommendation	No of countries with minor deviation from the recommendation	Countries with minor deviations	Comments on deviations
Mail Survey	21	5	EE - CY - LU - PL - PT	**CY:** Face-to-face interviews, resulting in extremely high response rates **EE:** Online survey **LU:** Face-to-face survey. We expect that this method decrease measurement errors and item non-response and increase response rate **PL:** electronic survey. Positive impact on the quality **PT:** We used an on line platform. In exceptional cases we sent a questionnaire paper version
Reminders	25	1	CY	**CY:** No need for sending reminders by mail
STRATIFICATION OF THE SAMPLE				
NACE	21	3	IE - LU - AT	**LU:** OECD Technology classification was used for the manufacturing sector. **AT:** Stratification was done according to "groups of NACE-2-digits" (see respective chapter in this report). No impact expected
Size	19	5	DE - EE - IE - FR - NO	**DE:** 8 size classes were used for sample stratification by size class: 5-9, 10-19, 20-49, 50-99, 100-249, 250-499, 500-999., 1000+ employees. **EE:** Size-classes used 10–19, 20–49, 50–99, 100–249, and 250+. No whatsoever impact **FR:** French criteria are even more precise for small units, since the size class "small enterprises" is divided in the French survey in 2 subclasses: 10-19 employees and 20-49 employees **NO:** More detailed size classes. No practical impact when aggregating up to CIS 2008 classes.
SAMPLING				
Sampling method	21	3	DE - IE - NO	**DE:** stratified sample with disproportional sampling according to the observed variation in key innovation indicators (innovation expenditure as a percentage of sales, share of innovative enterprises) **NO:** Supplementary sample to enhance regional coverage. No significant impact compared to base sample.
SAMPLE ALLOCATION				
Allocation method used	24	-		
PRECISION (2)				
Percentage of innovators	24	-		

CONCEPT / ISSUE	No of countries adopting the recommendation	No of countries with minor deviation from the recommendation	Countries with minor deviations	Comments on deviations
Share of new or improved products in turnover	24	-		
Total turnover per employee	23	1	LU	**LU:** A deviation is found according to the expected precision of this indicator (see Table 4.1).
UNIT RESPONSE				
Non-Response survey**	25	1	BE	**BE:** partial deviation
Results? Reweighting after the NR survey?	25	2	BE	**BE:** partial deviation
DATA PROCESSING				
Parameters (3)				
Use of Eurostat quality control rules	26	-		

3.5.2 Comparability over time

Comparability over time, i.e. between the statistics published by each country across the years is also very important. The national statistical authorities reported some inconsistencies in the time series of national innovation statistics. Table 8 presents the percentage relative differences compares key variables for aggregated CIS 2008 data with CIS 2006 data for five key indicators: a) Inn_Ent = Proportion of enterprises with innovation activity, b) Co_N = enterprises with co-operation arrangements, c) RTOT = total innovation expenditure as a % of total turnover for enterprises with innovation activity, d) Turnnew_all = turnover from all new products as a % of total turnover, for enterprises with innovation activity, e) Turnnew_mkt = turnover from new products new to the market as a % of total turnover, for enterprises with innovation activity (Turnnew_mkt).

We may notice that for some indicators and certain countries the comparability between CIS 2006 and CIS 2008 seems to be restricted.

Estonia mentioned that differences between the two waves may be explained by the fact that the country became a MS in 2004 leading to significant organisational changes in the enterprises.

Germany reported that the differences in "Turnover from new products new to the market as a % of total turnover" between CIS 2008 and CIS 2006 are due to changes in imputation methods, with the more accurate method applied for CIS 2008.

Austria mentioned that among the main reasons for lack of comparability are the expansion of the definition for "innovation", the first-time inclusion of "innovation expenditure" and the implementation of NACE Rev. 2 in CIS 2008 data collection.

The change in the NACE classification was also highlighted by Norway. In addition to this, they further noted that the differences in the proportion of innovative enterprises and the enterprises with co-

operation arrangements are impacted by the omission of the size group '10-19' in NACE groups F and H while the differences in turnover indicators are impacted by a change in the method for obtaining turnover data. Numbers for CIS 2006 were generally somewhat underreported. In addition, the CIS 2006 sample did not include certain large enterprises with a dominant turnover. Ignoring actual turnover and adjusting for comparability, the weighted reported numbers for these variables are only slightly lower than in CIS 2006 overall.

Table 8. Comparison between CIS 2006 and CIS 2008 data (relative difference).

	Inn_Ent	Co_N	RTOT	TURNNEWALL	TURNNEW MKT
BE	109.05	72.36	101.86	119.97	103.57
BG	84.43	127.79	96.89	84.03	99.84
CZ	84.10	119.40	97.90	95.60	107.40
DE	98.00	136.00	104.00	106.00	267.00
EE	99.00	123.00	59.00	74.00	92.00
IE	105.12	117.46	102.04	129.48	118.07
ES	117.00	75.00	92.00	100.00	103.00
FR	103.60	93.20	111.20	87.40	88.20
IT	84.30	78.30	136.40	78.00	80.00
CY	92.10	133.70	125.20	76.00	285.20
LV	73.17	236.02	51.39	57.99	53.55
LT	63.90	93.40	42.60	90.30	57.10
LU	105.00	110.00	484.00	150.00	181.00
HU	98.88	91.76	88.12	64.27	74.89
MT	84.00	116.00	91.00	127.00	143.00
NL	100.20	94.80	105.90	105.90	90.10
AT	118.00	100.40	-	112.00	111.00
PL	116.00	124.00	87.00	98.00	94.00
PT	69.94	73.08	151.87	109.69	102.00
RO	110.00	1.20	103.80	157.30	140.30
SI	-	-	-	-	-
SK	46.18	87.59	242.34	133.86	117.02
FI	111.00	175.00	-	100.00	116.00
SE	-	-	-	-	-
NO	81.20	78.60		176.60	133.90
HR	94.47	93.81	119.97	104.05	68.36

3.6 Coherence

3.6.1 Coherence with Structural Business Statistics

Table 9 below shows the relative differences in absolute terms between aggregated CIS 2008 data and SBS data from 2008 for the following five key variables: a) Turn = Proportion of total turnover in 2008, b) Emp = Proportion of total number of employees in 2008, c) NbEnt = Proportion of number of enterprises by

NACE, d) RrdInx = Proportion of expenditure in intramural RD, e) TurnEmp = Proportion of total turnover in 2008 per employee. Information is displayed only for the countries that have provided this information.

The comparison between SBS and CIS statistics may be used to indicate whether the results from the two surveys are comparable or not and could be used for further analysis.

There seems to be a different degree of deviations between the indicators displayed in the table. This means that the difference in coverage between the two surveys may have greater impact on some indicators and lower on others.

In addition, the definition of employment in CIS (number of employees) differs from the definition in SBS (persons employed). This difference may also affect the coherence between the two data collections.

Table 9. Comparison between SBS and CIS 2008 data (relative differences)

	Turn%	Emp%	NbEnt%	RrdInx%	TurnEmp%
EE	96.00	96.00	100.00	87.00	99.00
IT	104.90	97.10	100.10	-	110.80
CY	114.10	115.90	120.50	-	98.50
LV	93.40	95.30	99.70	-	-
LU	115.40	97.00	100.40	-	119.00
HU	102.20	103.00	104.70	105.80	99.20
MT	98.67	106.43	111.26	-	95.12
AT	104.10	102.10	107.90	-	102.00
PL	128.00	130.00	139.00	-	433.00
RO	100.00	94.40	100.60	-	104.60
SK	97.29	91.67	103.30	86.80	106.14
FI	99.00	99.00	102.00	-	100.00

4 Comparison with CIS 2006

In this section a comparison of the CIS 2008 is made with the previous data collection, CIS 2006, in terms of accuracy, timeliness, comparability and coherence. This comparison serves in highlighting the improvements made in the quality of CIS statistics.

The following assessment covers the countries that have participated in both CIS 2006 and CIS 2008 data collection and have also delivered their quality reports.

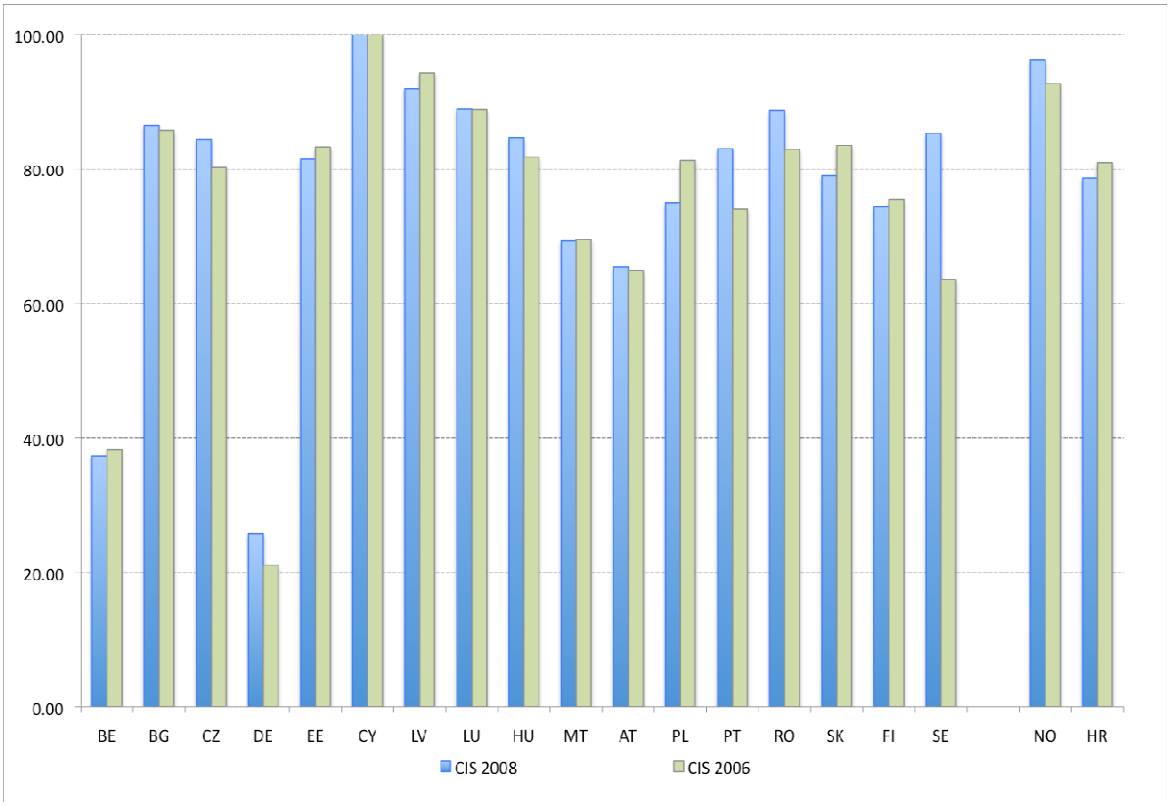
Accuracy

A quantitative indicator of accuracy is the response rate. Figure 6 presents the un-weighted response rates in the CIS 2006 and 2008. It is apparent that in both rounds the rates are high indicating that the data collected are accurate. Latvia and Norway report response rates above 90% while Cyprus achieved 100% response rate. Notable exceptions are Belgium and Germany whose rates are below 40% in both collections.

In most of the countries there are slight differences between the response rate in CIS 2006 and in CIS 2008 that do not exceed 5%. Bulgaria, Czech Republic, Germany, Luxembourg, Hungary, Austria and Norway report higher response rates in CIS 2008. Improvements are more notable in Romania and Portugal. In 2008 the CIS became a part of the Swedish official statistics making the survey mandatory for surveyed enterprises. This explains the considerable increase in Swedish response rate from CIS 2006.

On the contrary, Slovakia and Poland report significant reductions in the response rates of 2008 compared to the 2006 data collection that do not however exceed 7%,

Figure 6. Response rates (%) in CIS 2006 and CIS 2008.



Timeliness in CIS 2006 and CIS 2008

Timeliness reflects the length of time between the availability of statistics and the event or phenomenon they describe. Figure 7 shows the number of months that passed since 2006 and 2008 before CIS data become available to users. It is noted that the timeliness of CIS 2008 data has been the same or improved compared to the 2006 data collection. The most notable improvement is reported in Ireland, where CIS 2008 results were released 16 months after the end of the reference year, which is 11 months earlier than in CIS 2006.

Figure 7. Timeliness of CIS statistics for the 2006 and the 2008 data collection.

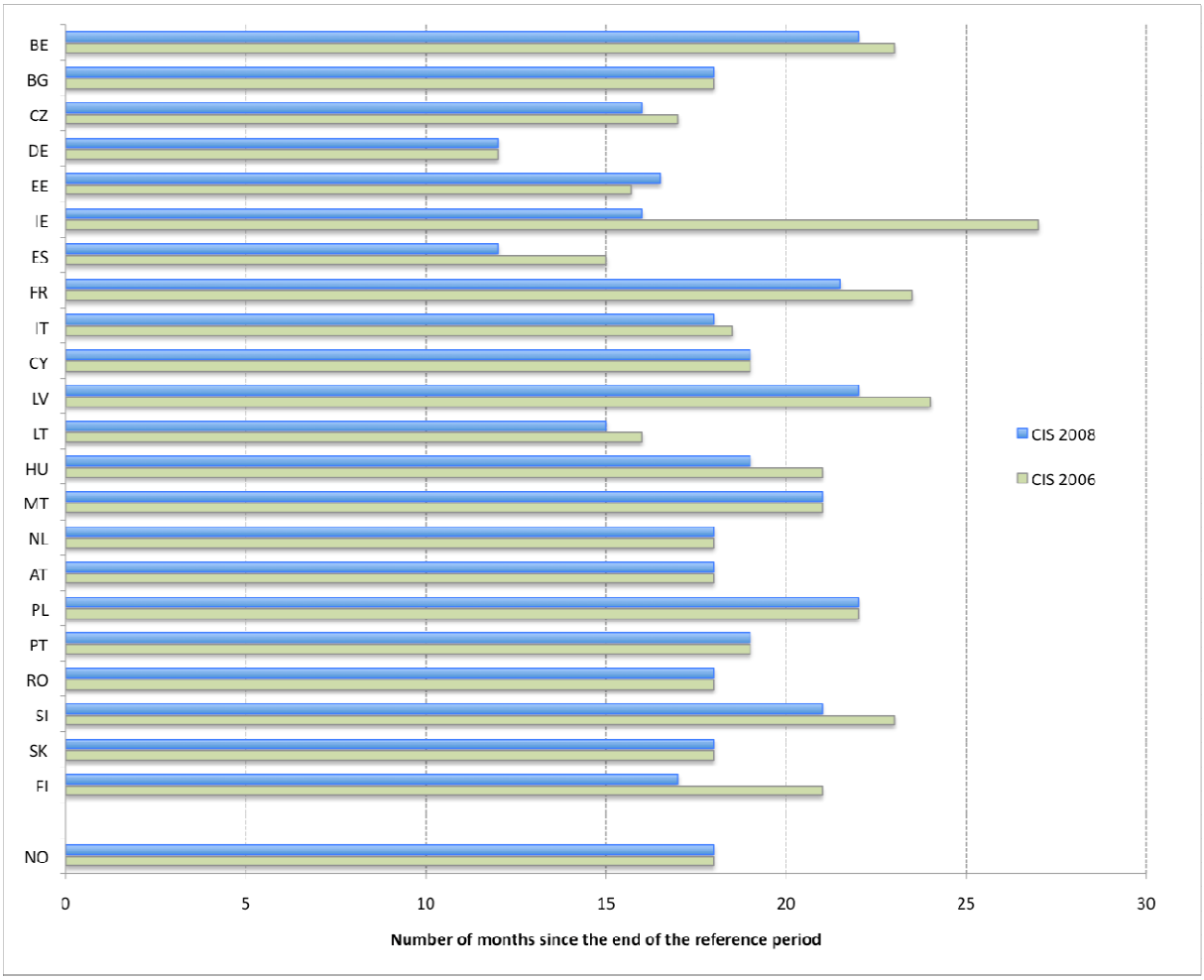


Table 10 shows the methodological deviations from the recommended guidelines in the CIS 2006 and the CIS 2008 data collection. Information on the national deviations is only presented for countries that participated in both rounds and provided the respective information in their national reports. These are 19 countries in total[6].It is noted that the number of countries adopting the recommendations in CIS 2008 has either remained the same or has decreased. The most notable differences between the two rounds appear in the compliance with the recommendations for the questionnaire, the data collection and the sampling method where the number of countries with deviations is much greater in CIS 2008.

[6] These countries are Belgium, Bulgaria, Czech Republic, Germany, Estonia, Cyprus, Latvia, Luxembourg, Hungary, Malta, Austria, Poland, Portugal, Romania, Slovakia, Finland, Sweden, Norway and Croatia.

Table 10. Methodological deviations in CIS 2006 and CIS 2008

CONCEPT / ISSUE	CIS 2008		CIS 2006	
	No of countries adopting the recommendation	No of countries with minor deviation from the recommendation	No of countries adopting the recommendation	No of countries with minor deviation from the recommendation
QUESTIONNAIRE				
Deviation from the harmonised CIS 2008 questionnaire	10	9	16	3
National data collection period	19	-	19	-
Deviation from the sampling frame	17	2	19	-
TARGET POPULATION (1)				
NACE sectors covered	15	4	16	3
Size classes	17	2	16	3
Statistical unit	18	1	19	-
SURVEY METHODOLOGY				
SAMPLING FRAME				
Sampling frame	18	1	19	-
Date of business register extraction	18	1	19	-
DATA COLLECTION				
Survey method	19	-	19	-
Mail Survey	14	5	17	2
Reminders	18	1	17	2
STRATIFICATION OF THE SAMPLE				
NACE	15	2	16	2
Size	14	3	17	1
SAMPLING				
Sampling method	15	2	18	-
SAMPLE ALLOCATION				
Allocation method used	17	-	18	-
PRECISION (2)				
Percentage of innovators	17	-	18	-
Share of new or improved products in turnover	17	-	18	-

CONCEPT / ISSUE	CIS 2008		CIS 2006	
	No of countries adopting the recommendation	No of countries with minor deviation from the recommendation	No of countries adopting the recommendation	No of countries with minor deviation from the recommendation
Total turnover per employee	16	1	18	-
UNIT RESPONSE				
Non-Response survey**	18	1	3	-
Results? Reweighting after the NR survey?	18	1		
DATA PROCESSING				
Parameters (3)				
Use of Eurostat quality control rules	19	-	19	-

Coherence with SBS statistics in CIS 2006 and CIS 2008

Countries are asked to assess the coherence of CIS statistics with SBS statistics for the same reference year. Table 11 presents the relative differences between SBS and CIS for 2006 and 2008. The number of countries presented is limited mainly due to the lack of available SBS data in either the 2006 or the 2008 data collection. The differences between the two rounds are small and it is difficult to assess the improvements, if any, in the coherence of CIS statistics. In Finland it seems to be clearer that CIS 2008 statistics are more coherent than CIS 2006.

Table 11. Coherence with SBS statistics in CIS 2006 and CIS 2008.

		Turn%	Emp%	NbEnt%	RrdInx%	TurnEmp%
EE	CIS 2008	96.00	96.00	100.00	87.00	99.00
	CIS 2006	97.00	100.00	100.00	94.00	100.00
CY	CIS 2008	114.10	115.90	120.50		98.50
	CIS 2006	101.70	116.50	128.20		87.30
MT	CIS 2008	98.67	106.43	111.26		95.12
	CIS 2006	102.00	106.00	105.00		107.00
AT	CIS 2008	104.10	102.10	107.90		102.00
	CIS 2006	103.10	94.30	103.80		109.30
RO	CIS 2008	100.00	94.40	100.60		104.60
	CIS 2006	99.70	100.20	103.30		99.00
FI	CIS 2008	99.00	99.00	102.00		100.00
	CIS 2006	86.00	84.00	93.00		102.00

5 Conclusions

The overall quality of the CIS 2008 data collection is regarded as good following the assessment of the standard quality dimensions. Starting from relevance, the majority of countries may not carry out a user satisfaction survey but are aware of their users and their needs in the field of innovation statistics. The completeness of CIS data is also high as almost all countries transmit all compulsory data.

The accuracy of CIS statistics is also considered to be good. In terms of methodology, most countries use a combination of a sample survey and a census in order to ensure high coverage of the target population and good quality in the data collection. In addition, the wide use of the business register as a sampling frame reduces coverage errors.

The most critical quality problems are reported to be linked to the phenomenon under study itself, innovation. In several cases enterprises cannot necessarily assess with precision whether their own activities are innovative or not. The widespread distribution of these activities in the enterprise and somewhat subjective assessment as regards the innovation activities can also set some reservations to the data. These issues have been and continue to be tackled with less ambiguous wording of the survey questionnaires and more clear instructions.

As regards response rates, it is worth mentioning that in CIS 2008 almost all countries reported rates over 70%, which is a very positive sign for an enterprise survey. This reduced the need for a non-response survey and for imputation, which is indeed limited in CIS.

The CIS 2008 data collection was carried out following the Commission Regulation No. 1450/2004, the CIS 2008 harmonised questionnaire and the methodological recommendations developed in close cooperation with the Members States. The compliance of almost all countries with these documents resulted in high quality of the data collected. National deviations are mainly reported in the survey questionnaire and the coverage of NACE sectors. Especially for the latter, it should be mentioned that a great number of countries cover enterprises in sectors outside the core population with focus on enterprises in research and development (NACE 72) and in construction (NACE 41-43).

Moreover, the punctuality of CIS statistics is very good as almost all countries transmit their data on time by using the eDAMIS application recommended by Eurostat. Data are also released in a short period after the reference year resulting in high timeliness of CIS. Several countries publish their data nationally earlier than the deadline for transmission to Eurostat.

Finally, the coherence between CIS and SBS statistics is satisfactory in most key variables. Nevertheless, methodological and conceptual differences between the two surveys may have a significant impact on the differences of the statistics produced.