

Quality Improvement of the EuroGroups Register

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Abstract

The EuroGroups Register (EGR) includes information on multinational enterprise groups and its constituent units when at least one legal unit of a group is located in a European country. The EGR aims to serve as backbone for European business statistics, in particular concerning globalization by providing cross-border information. The paper will discuss quality aspects of the EGR data by analysing different direction to improve the current quality.

Keywords: Data quality, Enterprise, EuroGroups Register (EGR), Profiling.

1. Background

The EuroGroups Register (EGR) is the statistical business register of multinational enterprise groups in Europe and contains structural economic information on multinational enterprise groups, their constituent legal units and corresponding enterprises, having at least one legal unit located in the European Union or in a country of the European Free Trade Association (EFTA).

The purpose of the EGR is to offer users a tool for coordinating population frames across different countries.

This purpose is achieved through the European Statistical System (ESS) cooperation: Eurostat and the national statistical institutes (NSI) of European Member States (MS) and EFTA countries are pooling together their micro data to realize a complete, accurate, consistent and up-to-date picture of multinational enterprise group information.

The EGR is one component of a broader system called the European System of Business Registers (ESBRs) which is established as a complete and consistent European system of interoperable business registers comprising of National Business Registers (NBRs) and the EGR. The ultimate goal of the system is to provide a coherent set of frames to a variety of

stakeholders to support the production of statistics based on directly collected data (surveys) as well as on administrative registers and other secondary sources on the national as well as the European level contributing and thereby providing high quality information on the European economy and society in a globalized context.

In the framework of the implementation of the ESS Vision 2020, an ambitious project has been launched at ESS level to improve the ESRs in order to reduce inconsistencies, enable globalized approach to business statistics and reduce inefficiencies in the production of the statistical frames. This project has followed an architecture approach. One of the deliverables of this project is the ESRs Business Architecture. This deliverable is described in a related paper. It describes how the future systems should operate (to be state) in response to the identified drivers. The business architecture has identified a number of key capabilities i.e. describing what is needed in terms of people skills and organization, processes, methodology, technology and standards to deliver the desired business outcomes. A foundational model of the business architecture is a high level workflow which describes the different steps for the coordinated production of frames and registers and the supporting capabilities needed to support this workflow. It is presented in annex 1 for the sake of completeness.

This paper deals with quality aspects of the EGR. As it will clearly appear in the following sections, the quality of EGR cannot be tackled in an isolated context. EGR quality depends closely on the process and data quality of the NBRs and is supported by key business function like profiling. Therefore it is important to analyze the EGR quality in this global context and to identify the capabilities in the system that are required for enabling the implementation of the EGR data quality programme (DQP).

In the first section, after having illustrated the current situation of the EGR quality by presenting a selection of key indicators reflecting the quality of the EGR production process, we present a general approach for improving the EGR quality. The approach is specified in the data quality program (DQP), which builds on the traditional ESS standard quality pillars: Quality reporting, quality standards, quality assessment and quality improvement.

In the following section, we further detail the development made on the profiling methodology for European enterprise groups, which is expected to become a key constituent of the EGR with a strong impact on quality.

Finally, in the last section, we outline which are the capabilities of the target ESRs system that are necessary to develop and support the EGR DQP and we describe the requirements to realize it.

2. Current state of the EGR

The European Statistical Law¹ specifies 7 quality criteria for the European statistical output: relevance, accuracy, timeliness, punctuality, accessibility and clarity, comparability and coherence.

The monitoring and assessment of the EGR quality are currently reflecting an initial stage of quality management by focussing mainly on relevance and accuracy. In the context of SBR “*Relevant means that the data meet current and potential needs of the users in terms of units and characteristics to support the production of statistics. Accurate means that the information recorded corresponds to reality*”².

As the national statistical business registers (NSBR) are the main sources for compiling the EGR, the quality management of the EGR is highly depending on the quality of the NSBR.

As the EU legislation on statistical business registers³ in force can be seen as the expression of user needs, a first indication on EGR relevance can be derived from the completeness of the information recorded in the NSBR measured against the number of mandatory and optional characteristics described in the Regulation.

The relevant characteristics of NSBR are the identification characteristics, the demographic characteristics, the economic/stratification characteristics, information on control and ownership, links with groups, etc.⁴

According to Regulation (EC) No 177/2008, 35 characteristics are considered to be mandatory and shall be transmitted from the NSBR to the EGR. Information on those 35 characteristics is considered to be relevant for meeting the most important user needs.

The legislation supports in addition the provision on voluntary basis of 20 supplementary characteristics, which are relevant to fully meet the users’ requirements.

Table 1 provides the key figures regarding the EGR relevance on the basis of NBRs input.

¹ Regulation (EC) No 223/2009, Article 12(1)

² United Nations Economic Commission for Europe, “*Guidelines on Statistical Business Registers*”, New York and Geneva, 2015

³ Regulation (EC) No 177/2008 in combination with implementing Regulation (EC) No 192/2009.

⁴ The EGR reports 116 characteristics in total.

Table 1: Key figures with regards to relevance

	Required according to Regulation 177/2008 [number]	Provided by NSBR to EGR [number]	Provided by NSBR to EGR [%]
Mandatory characteristics	35	29,1	83%
Additional characteristics	20	9,4	47%

Furthermore, 75% of all ESS countries provide 80% of all mandatory characteristics or more and 50% of all those countries cover at least half of the optional characteristics.

A reasonable proxy of EGR accuracy is provided by the number of errors detected throughout the EGR process. This indicator cannot be calculated in the current state of EGR process. It will be calculated in a standardized manner and used as a benchmark for quality improvements from 2017 onwards.

Several indicator sets will be calculated at different stages of the production process: input, throughput (transformation and consolidation of the input data into intermediate data) and output.

1. Input - All incoming data will pass through a validation phase. Missing mandatory information, invalid coding or invalid format of characters will generate error reports that will be analysed to evaluate the input phase.
2. Throughput – The error rates during transformation of the information in the throughput phase will also be analysed as an indication of accuracy.
3. Output – The quality of the output will be measured by comparing the population available in the EGR and the population in the national Foreign Affiliates Statistics (FATS), taking into account the conceptual differences. Separate indicators will be calculated for inward and outward FATS.

3. EGR Quality improvement

The quality of the EGR is highly depending on the quality of the national statistical business registers. Thus, to fulfil the EGR mission in the ESS, quality management and quality improvement should be considered as an integral part of the European System of Statistical Business Registers (ESBRs) ensuring high quality of the data in NSBR and in the EGR.

ESBRs quality management will be organized through the annual data quality program (DQP) that will set quality standards (targets) for input, throughput and output of SBRs processes based on the ESS quality assurance framework.

The DQP will target improving consistency, accuracy and comparability of national and international processes and outputs in the European network of SBR by:

- recommending good practices in the short run;
- harmonizing methodology and processes in the production and dissemination of NSBR and EGR as far as necessary and possible ;
- identifying best practices and promoting the use of common tools (in the longer run);
- continuously monitoring and assessing the quality of NBRs against targets.

The envisaged DQP will cover four areas: Q-reporting, Q-standards, Q-assessment, Q-improvement. The DQP will also specify the communication aspects related to quality.

The measures taken for improving the quality of SBR in Europe – by providing a better survey frames – all promote the overall goal to improve European Business Statistics in particular for statistics related to globalization.

3.1 Quality reporting

A first part of the quality framework aims to settle a standardized quality and metadata reporting for NSBRs and EGR.

The information and indicators provided with annual quality reports will be used to monitor and assess the quality of the SBR frames and their compliance towards the Regulation. The quality reports are for SBR-internal purposes only.

To better inform users on the background of SBRs, metadata report on NSBRs in general and on the EGR will be published annually. These metadata reports will follow the standardized ESS structure for metadata, the Euro SDMX Metadata Structure (ESMS).

3.2. Quality standards

The second part of the quality framework sets the quality standards to enable assessment of NSBR and EGR frames throughout the entire production processes, related exchange processes and resulting outcomes included, and measured by adequate – input, throughput and output – quality indicators. The quality standards are retrieved from legal requirements and user needs.

To help MS to achieve the quality standards, a catalogue of good practices will be set up. MS being recognized for their expertise and experience in specific domains will be asked to provide descriptions of their good practices.

3.3 Quality assessment

The third part of the quality framework is addressing the assessment of input, throughput and output quality of NSBRs and EGR. Standardized templates for benchmarking against the target quality standards will be used to assess the SBR quality annually.

The assessment is done for each quality standard separately to identify weaknesses and lead to concrete improvement actions. These indicators and the planned actions will be in assessment reports for NSBR and the EGR. The assessment reports will be for SBR-internal purpose only.

The classification of the specific standards into quality categories shall be discussed and regularly reviewed with MS.

3.4 Quality improvement

A fourth part of the quality framework concerns the agreement and the coordination annual improvement actions aiming at:

- gradually increasing the compliance with respect to the Regulation standards
- improving the accuracy and comparability dimensions of quality.

An annual compliance round will address all MS that provide insufficient information in their NSBR according to the Regulation. MS categorized to be non-compliant have to explain the means and the envisaged timeline for solving the non-compliant issues.

To meet the quality standards in addition to compliance issues the MS annually define/revise and prioritize a list of specific SBR quality related actions aiming at better harmonizing processes and aligning methodology. This may also include the use of profiling and its integration with the EGR. A task force will be set up to develop proposals on how to deal in the best way with identified aspects in annual improvement rounds.

3.5 Communication and diffusion of aggregated information

A good and efficient communication has to be installed both inside and outside the SBR network. Several initiatives are planned, including:

- establishment of SBR contacts' and SBR roles' lists;
- promoting the use of the collaborative (Wiki) platform;

Moreover some reflections and pilot tests are going on concerning the possibility of using EGR not only to produce frames for statistical users but also to produce directly some aggregated information. Users' feedback on such information is expected to help better identifying gaps in the EGR quality.

4. Quality improvement and profiling

European Profiling allows defining the statistical units “enterprises” in the context of the multinational enterprise groups. It analyses the economic and operational structure of the group without taking into account the geographical borders. It takes into account the global dimension of the groups and reflects better the groups’ activities (it is closer to the group’s vision).

European profiling allows building a bridge between the global vision of the group and the national statistical needs. It allows improving the consistency between NBRs and EGR and ultimately EU statistics in defining in a consistent way the Truncated ENterprises (TEN) of a Global Enterprise Group (GEG).

Profiling adds to the EGR the economic dimension of multi-national enterprise groups and contributes to improve its quality. Up to now, the EGR only presents the legal structure of the groups. The profiling adds the economic dimension by defining Global Enterprises (GENs) and TENs and their content in terms of legal units.

Profiling is a “building block” in the implementation of the statistical unit “enterprise” as it allows defining the enterprises in the context of multinational enterprise groups.

A first profiling project, being closely related to the EGR, was launched in 2009 as a part of the programme for the Modernisation of European Enterprise and Trade Statistics. A collaborative platform was set up in November 2009 for a 4-year duration. 7 ESS members took part in this action: National Statistical Institutes (NSIs) of Finland, France (coordinator), Germany, Italy, Netherlands, Switzerland and United Kingdom.

As a continuation, a new collaborative platform was established to build upon the existing work done in the previous ones regarding the EGR and profiling and concentrate its activities on methodological and technical tasks that are necessary in order to improve the quality of the EGR, the finalization and stabilization of the methodology of profiling and the technical development of the EGR which all are necessary in order to fully integrate the results of profiling.

In 2016, the Interactive Profiling Tool (IPT) prototype was made available by the ESRs project to the ESS profilers, aiming to support them in their profiling efforts. IPT is a central on-line collaborative platform, enabling secure data exchange and remote access to profiling micro data, as well as collaborative profiling on a single data version.

Regarding profiling, currently on-going work is focused on:

- further developing and completing the profiling methodology,
- proposing a business process in order to integrate the results of profiling into the

EGR via the IPT,

- providing all the necessary documentation for said methodology and process,
- supporting NSIs in the implementation of profiling and proposing organizational models for it.

Currently on-going tests of the methodology of European profiling in several countries tends to prove that the approach proposed so far is feasible, even if it still needs some adjustments. These tests allow evaluating the needs of the NSIs to adopt this methodology and introduce it in their statistical architecture.

In the meanwhile, the use of European profiling to delineate the enterprise in the frame of large and complex GEGs cannot be questioned, since it increases consistency between national business statistics in the NSIs. It allows all NSIs to have a consistent view on the enterprises belonging to the same GEG and gives a picture of the economy (national and EU) closer to the GEG's perspective, so that the statistics based on these statistical units should be more accurate both at the national and EU levels.

While future work entails profiling-related responsibilities to shift towards providing continuous support for the NSIs performing profiling, through a Centre of Excellence, European profiling should also allow solving problems that cannot be solved otherwise and to treat cases that are not anymore treatable keeping a strict national perspective. Some GEGs organise their reporting at a geographical level higher than the country. In some cases, even if the situation of the production has not changed, its representation through the follow-up of the legal units at the national level leads to breaks in the series and statistical misinterpretations. The only way to solve such cases is to survey a higher level of entities (the GEN or the GEG).

Finally, after an adaptation period, the system of business statistics in European NSIs should benefit of gains in efficiency and avoid double work in NSIs. This should be especially obvious in the long-term perspective of central collection.

5. Requirement on ESBRS target capabilities

The implementation of the DQP will put some additional requirements on the different target capabilities of the ESBRS system. Using the capabilities identified in the ESBRS BA as a reference, table 2 provides a few examples of requirements on these capabilities induced by DQP . This analysis is not exhaustive but indicates the use and the need of the ESBRS Enterprise Architecture to carefully design and successfully realize the quality improvement in a complex system.

Table 2: "Quality" requirement for ESBRS target capabilities

ESBRs target capability	Requirements linked to quality
Governance of the European system of Interoperable Business registers	The governance of ESBRS should encompass procedures and role definition for the coordination and agreement of ESBRS quality improvements actions
Evolutionary maintenance of ESBRS Business Architecture and Interoperability Framework	The business architecture should be complemented with description of the quality indicators to monitor the quality of data and processes at identified quality gates (input, throughput and output)
Quality management on cross-border control relationships	A harmonized methodology for the cross border relationship is necessary to ensure coherence of the quality checks and their gathering at EGR level A standardized instance of the quality management function is desirable avoiding developing 27 times the same function. The input to this function is standardised error messages This instance would allow the logging of errors recorded at central level and a function to build the corresponding indicators.
European profiling	By its nature, this capability require a shared platform for realizing a collaborative and harmonised profiling The platform should allow the logging of errors to be used in
National profiling	A harmonized methodology for the profiling is necessary to ensure coherence of the quality checks and their gathering at EGR level This function should generate standardized errors message to be recorded by the quality management systems
Creation of national frames	A function allowing benchmarking with other (non-national) frames is necessary to support the monitoring of the DQP
Select, validate and transmit information on national frames to EGR	A validation service that identify errors in national frames and produce standardized error message and reports
Validation of global frames	A function should generate standardized errors message to be recorded by the quality management systems
Production of meta and quality information on national and global frames	An information system to maintain and store centrally quality reports and process quality metadata in a standardized format is necessary.
Selection and retrieval of global frame populations for survey frames on globalisation statistics	A function should provide access to quality reports and process metadata
Requesting, receiving and sending securely ESBRS data	The data exchange network should also allow exchange of process metadata and quality report

6. Conclusions

The monitoring and assessment of the EGR quality are currently reflecting an initial stage of quality management.

The overall objective for the SBR quality project is to develop an overall data quality program for the NSBRs and the EGR until end of 2016 and to initialize a substantial improvement of SBR quality from 2017 on.

The regular use of profiling in the ESS Member States and the Enterprise Architecture approach are expected to provide a relevant contribution on the path to a high EGR quality.

Annex 1: ESBRs target business process model and supporting capabilities (ref. ESBRs Business Architecture)

