

Quality Improvements in the EuroGroups Register Process and Products

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Abstract

The EuroGroups register (EGR) is the European statistical register on multinational enterprise (MNE) groups created by the European Statistical System (ESS) and managed by Eurostat. It receives input data from the National Statistical Institutes (NSIs) of the European Union (EU) and European Free Trade Association (EFTA) countries, a commercial data provider (CDP), and public data sources (i.e., Companies House data for the United Kingdom), consolidates them and makes it available for statistical purposes.

The EGR is updated annually, and Eurostat disseminates several statistical frames with confidential micro data to statistical users in the ESS, tables of aggregated data and Statistics Explained articles as experimental statistics to the public. To ensure better timeliness and higher accuracy in particular on those large MNE groups that significantly impact the European statistics, a new strategy for the data quality management is in place, with a focus on European profiling. European profiling is the activity of different NSIs, in collaboration with each other to analyse the legal, financial, and economic structure of the largest MNE groups as well as the statistical delineation of their enterprises.

Following on the concept of profiling, Eurostat designed a system to split of the EGR's population in two groups, a top tier (largest, most important, and complex MNE groups) and a bulk tier (the rest). This allows for two different and cost-effective data quality management processes to update the two sub-populations, to meet the increasing demand in timeliness and accuracy from users.

Eurostat has set up the project for the Future EGR to meet the data quality management strategy together with the expressed user needs. This paper highlights the quality improvements that have been implemented to EGR and an overall view on the different possibilities to better use the EGR richness of data, including the dissemination of further experimental statistics.

The major quality improvements achieved in the last two years concern the higher accuracy, frequency, and timeliness of the data. At T + 11 months for the reference year 2022, using the automatic exchange of the data from the profiled groups, the EGR already contains high quality information, including the results of profiling on the largest MNE groups. For the reference year 2023, an additional frame at T + 4 months will be released. Further automations for the treatment of the bulk tier with standard data checks are continuously conducted to ensure the highest quality of the data and the correct implementation of the European business statistics regulation (European Parliament and Council of the European Union, 2019). Additional data sources to increment the informative value of the EGR especially for the economic variables, and to reduce the cost of maintenance, are also gradually integrated in the EGR production process.

Finally, relevant efforts are put to enhance the communication with users and the collaboration with other Directorates at the European Commission to better serve their current and future needs of statistics on MNE groups.

Keywords: EGR, globalisation, MNE groups, European statistical business registers

1. Introduction

Globalisation has a significant impact on the global economy. In this environment, the multinational enterprise (MNE) groups play a vital role. To better analyse cross-border transactions of large MNE groups and correctly record them in statistical business registers, statisticians in the European Statistical System (ESS) and European System of Central Banks (ESCB) need to be able to observe the complete and correct economic structures of MNE groups.

The EuroGroups register (EGR) is the European statistical register on MNE groups created by the ESS and managed by Eurostat. It receives input data from the National Statistical Institutes (NSIs) of the European Union (EU) and European Free Trade Association (EFTA) countries, from a commercial data provider (CDP), and from public data sources (i.e., data from *Companies House* for the United Kingdom). It consolidates them and makes it available for statistical purposes. It is regularly updated and produces statistical frames of microdata in yearly cycles. The EGR covers the MNE groups, their consisting enterprises and legal units, and their respective core economic variables.

The EGR aims to register all MNE groups that have enterprises in EU Member States or EFTA countries, including European and non-European groups. The EGR does not cover all-resident enterprise groups, i.e., those that consist of enterprises only in one country, nor independent enterprises.

The EGR microdata helps to explore the structure and impact of MNE groups in Europe. The EGR makes it possible to present results from two sides: from the MNE group perspective, based on the country of control of the group, and from the national perspective of the country in which the group is located, irrespective of where the ultimate controlling institution (UCI) is located.

This paper is structured as follows: first, it highlights the main aspects of the project, with a brief presentation of the history of the EGR. Second, an overview of the current and future ongoing improvements is provided. Third, the main communication aspects of the EGR team with the different stakeholders are described. Finally, we conclude.

2. The history of the EGR

The origins of the EGR project can be traced back to 2003, when Statistics Canada submitted a paper to the United Nations Economic and Social Council (Barnabé & Statistics Canada, 2003), which sought to measure the activities of MNEs. The results showed that it was necessary to build a system – across countries – that integrated information on MNE groups in order to provide better quality statistics.

As a result of the exercise presented by Statistics Canada, in 2006, Eurostat launched the EGR pilot project to create a European business register on MNE groups, and the EGR version 1.0 was finally set

up in 2008. This first version was based on the use of two commercial data purchased and merged by Eurostat, while the role of the NSIs was to validate the results against their national business registers' information on truncated parts of the MNE groups.

In 2011, the concept of EGR version 2.0 was launched with the aim to: (i) improve the EGR's process and functionalities; (ii) create online applications for users with remote access; (iii) introduce a system to assign unique identifiers to legal entities within the EGR's data exchanges; (iv) improve the quality of output; and (v) target a complete coverage.

According to the new concept, EU Member States and EFTA countries became the main data providers, sending microdata to Eurostat from their national business registers, while the commercial data remained only to cover the extra-EU-EFTA information missed at national level.

After a transition period, the EGR version 2.0 started being used in 2015 for the creation of the data for the reference year 2013.

Currently, for the reference year 2022, the EGR contains the complete information for 146 427 MNE groups, which include more than 1 million enterprises and almost 1.5 million legal entities.

3. The new EGR process and products

The introduction of the new European business statistics regulation (European Parliament and Council of the European Union, 2019) defined the EGR as the authoritative source for the register population for business statistics requiring the coordination of cross-border information related to MNE groups. This means, in practise, that all business and trade statistics that use information about control of enterprises shall use the EGR in order to ensure consistency and avoid asymmetries in European statistics. To create the EGR, the regulation sets up the legal framework for mandatory exchanges of confidential microdata between the National Statistical Institutes and the Commission (Eurostat).¹

In parallel, the 2019 DIGIT Bratislava Conference on the Impact of economic globalisation decided that a strategy to bring together various activities, instruments, and capacities to tackle the impact of globalisation on statistics in a systematic, coordinated, and cost-effective joint approach was necessary:

¹ The microdata exchange is conducted using the EDAMIS system. The EDAMIS system allows the user to send data to Eurostat using secure transfer protocols. In case of confidential data, EDAMIS allows users to enable PGP encryption of the transmitted data files for additional security.

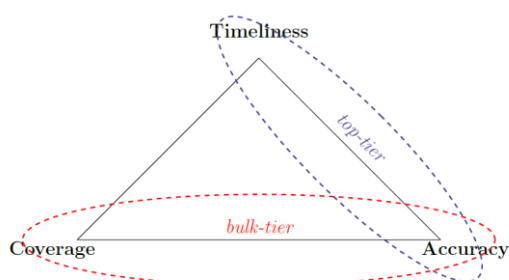
1. Ensuring “high quality and up-to-date statistical business registers (national and European), as a necessary infrastructure for the coordination of statistical activities and exchange of data on MNE groups”.
2. Frequently updating the set of “MNE groups with a significant impact on business and economic statistics at national and European level, that are subject to profiling to achieve the quality necessary to support the statistical production of economic globalisation statistics”.
3. Monitoring consistently the “fast-changing patterns of activities of large, complex, and dynamic MNE groups”.
4. Achieve the status of an “appropriate tool for high quality measurement of the impact of globalisation on statistical indicators”.
5. Providing the MNE groups information for addressing “asymmetries and microdata sharing necessary to improve data consistency at national and European level”.

Eurostat and the NSIs have been working collaboratively in the last years (with the support of a dedicated Task Force and of the Business Statistics Director Group (BSDG)), to improve the EGR statistical process and EGR IT system to serve those requirements.

The chosen approach had to be cost-effective and, at the same time, increase accuracy and timeliness. The solution consists in classifying the MNE groups recorded in the EGR in two tiers (as depicted in Figure 1):

- The first tier (top tier) consisting of the most complex MNE groups, that need to be followed up by a coordinated cross-country profiling treatment.
- The second tier (bulk tier) consisting of all the other MNE groups, that can be subject to an automated treatment via an annual coordinated process, including data production, exchange, and management. The automated process is necessary in order to treat the big number of groups. The more than a million legal units and their relationships in this tier is supported by automated data validations and quality controls.

Figure 1: two-tier approach in the EGR



This two-tier approach does not necessarily imply two different IT systems, but a distinction between two ways of maintaining the units in the same register based on their impact on the statistics.

3.1 Profiling and high quality of top tier MNE groups

In line with the above strategy of a systematic, coordinated, and cost-effective approach to MNE groups data, Eurostat also launched in 2021 the European Profiling programme:

The purpose of profiling is to analyse the legal, economic and operational structure of an enterprise group in order to delineate its enterprises in the best possible way to promote the compilation of the most relevant statistics – (European Commission and Eurostat, 2024) and (European Commission and Eurostat, 2020)

The European profiling is a cooperative process which is carried out by the profilers in the different NSIs, together with the support of Eurostat. The subset of MNE groups (top tier) that have to be manually and exhaustively profiled are selected every year by Eurostat according to a Complexity and Statistical Impact (CSI) index and subject to a prioritisation by the NSIs that agree on the relevance of this selection as including the major players in the EU economy and in their countries.

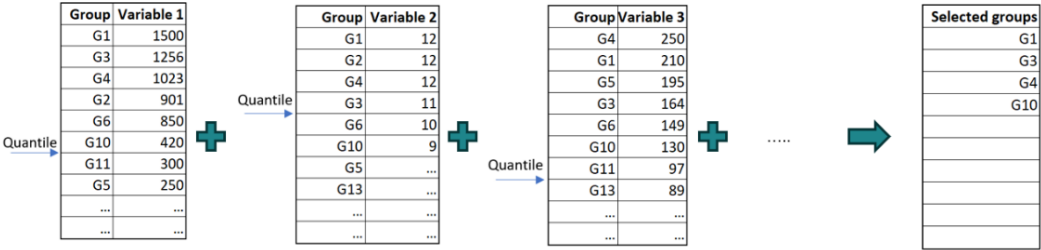
The CSI index is based on the size, complexity, and problematic nature of the MNE groups. To capture these three dimensions, a set of proxy variables available in EGR are used:

- CSI₁: number of legal units part of the MNE group.
- CSI₂: number of different economic activities of the MNE group (NACE).
- CSI₃: number of cross border relations (using the number of different countries with active units).
- CSI₄: number of employees in the EU and EFTA countries.
- CSI₅: number of employees in the largest active unit.
- CSI₆: number of ownership layers (operationalised as the number of parents of the lowest level unit).

The index is based on the quantile of the distribution of the above mentioned. For all the criteria except for CSI₄, the distribution is split into deciles. On the other hand, the CSI₄ distribution is split into 25 classes. A MNE group is considered to be a top tier group if its values for of the six distributions falls into the highest class: Figure 2 shows a possible scenario for the CSI index selection.

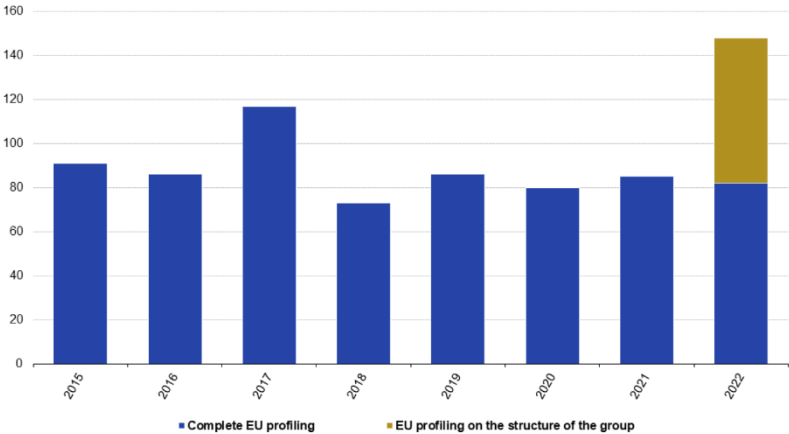
Using the index, a total of 1 636 top tier MNE groups were identified to be part of the top tier for the reference year 2022.² These top tier MNE groups cover more than 50% of the EU and EFTA employment of all MNE groups in the EGR. The results of the CSI index are evaluated annually, and possible improvement are regularly discussed with the NSIs to align with the user needs, resources, and special cases.

Figure 2: example of CSI selection



The profiling process is performed in an interactive tool developed by Eurostat in collaboration with the NSIs. The profilers are divided in: (i) profilers of the country responsible of the whole MNE group; and (ii) partner profilers, which are responsible for legal units and enterprises located in their country. European profiling requires substantial resources by the NSIs, and in 2023 some simplifications have been introduced³ to support NSIs and at the same time increase the number of treated MNE groups. The results have been very positive and in the same year 147 MNE groups were profiled, compared to an average of 80 MNE groups profiled during the previous years: Figure 3 depicts the number of profiled groups each year. In 2024, 190 groups have been selected for profiling.

Figure 3: number of MNE groups profiled each year



² The objective is to keep the number of selected groups within the threshold considered as sufficient by the BSDG and cover around 1 600 MNE groups per year.

³ The simplified EU profiling focuses the work on the delineation of the structure of the MNE groups and not on the individual statistical units.

The aim of EU profiling is to allow NSIs to be able to regularly follow up the 1 600 MNE groups selected by the CSI index for the top tier and offer statisticians that have to compile statistics on globalisation the best possible accurate and complete EGR.

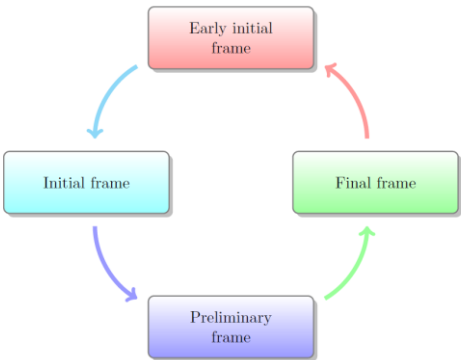
3.2 New EGR frequency and timeliness

Currently, the first EGR frame available to users is produced at T + 11 months and the final frame at T+15. To improve timeliness and better serve the needs of different statistical domains, new concepts have been introduced into the EGR and the work to implement these concepts is ongoing.

As a first step, in April 2024, the EGR early initial frame (EIF) has been put in production for the ongoing cycle (reference year 2023). The EIF at the beginning of the cycle starts with the situation as in the final frame released in March (T + 15)⁴, but compared to the previous EGR process allows national statistical business registers and profilers to start the data exchanges and the profiling work immediately 4 months after the closing date of the reference period. This responds to the need to incorporate all the updates on MNE groups as early as possible. The introduction of the EIF in the new EGR process is also an enabler to shorten the production of the frames before the current T + 11 and T + 15 months, as required by many users.

The EIF is seen as an essential step forward to implement the concept of an event driven model for the EGR production process, to have timely updates for the top tier MNE groups whenever new information becomes available to the NSIs, as depicted in Figure 4.

Figure 4: new EGR process



Two more steps (both in the EGR system and in the EGR process model) have to be implemented to achieve an EGR that finally satisfy all users requirements: the first one is that the EGR system becomes

⁴ The copy includes already some information available for the reference year T. This can include, for example, some liquidations, or early data from the commercial data providers.

a real time system, which will enable the immediate updating of the MNE groups structure as soon as the data from the different sources arrives. This includes, among other aspects, to enhance the performance of the EGR in terms of data processing and consolidation. The second one is that the EGR cycle becomes a continuous cycle being able to provide snapshots of the status of the MNEs at any point of time.

3.3 Completeness and accuracy. The use of new data sources for the EGR

Completeness and accuracy of the EGR data are essential to ensure the authoritative role of the EGR to support high quality and consistent European statistics on globalisation. However, the completeness of EGR data mostly rely on the completeness of the input provided by the national statistical business registers of the EU and EFTA countries. Eurostat is responsible of the production process of the EGR and therefore it attaches utmost importance to documenting each step of the EGR process and its data validation.

Eurostat is also continuously looking for additional data sources that can be used to complete the missing information in the EGR. The completeness of EGR is particularly necessary to enhance the dissemination of statistics on MNE groups from the EGR.

Throughout each step of the production process of EGR (input, throughput, and output), several validations are conducted to ensure the quality of the EGR data. These validations are instrumental in preventing and correcting data inconsistencies.

All data exchanges between EGR and the NSIs use SDMX and EDAMIS. The primary validation focuses on the structural (STRUVAL) and content (CONVAL) validations. These are automatic checks to ensure the file format, the defined data structure, and the completeness of the mandatory information. These validations also perform a range of checks from basic logical validation to intra- and inter-file plausibility and consistency of the information transmitted.

In the secondary validation phase, the Eurostat EGR team conducts thorough assessments of the different files received. This phase is crucial to identify and rectify any data inconsistencies or errors that might still exist after the primary validation. For instance, Eurostat verifies the completeness of the data by comparing the population of entities between several years, checks for possible duplicated entities, inactive enterprises linked to activities, etc. The results of the validations are communicated to the NSIs, that will implement the necessary correction to the data before it is processed and consolidated in the EGR system. Eurostat encourages NSIs to conduct these validation checks

meticulously before sending their files, highlighting the importance of a collaborative and proactive approach to maintaining data integrity across the European statistical system.

Furthermore, the Eurostat EGR team validates each EGR frame before it is released to statisticians in the ESS (see Table 1) and for the dissemination of aggregated experimental statistics. As a result, the quality of EGR data has significantly improved in the recent years.

Table 1: EGR frames of micro data on MNE groups available to statisticians

	2018	2019	2020	2021	2022
MNE Groups	133 000	137 882	135 450	155 983	146 427
Enterprises	714 656	711 983	885 063	977 145	1 028 041
Legal Units	1 086 465	1 153 500	1 284 050	1 433 512	1 442 932

As mentioned, some relevant economic information is still missing in the EGR, in particular the consolidated turnover of the MNE groups. This variable is particularly complicated for NSIs to collect, as it is not part of any official data collection, and it can be found only in the consolidated financial reports of the MNE groups. The aim is to achieve a good coverage of the consolidated turnover variable at least for the top tier MNE groups, which would account for a large share of the total value. The current limitations regarding the economic information available in the EGR reduce, for a subset of users, the usability of the data.

Table 2 illustrates the situation of the four main economic variables in the EGR for the reference year 2022. Some of them show poor coverage, while others are more complete. It is worth mentioning that not all variables sent by NSIs to EGR are mandatory according to the EBS Regulation.

Table 2: Missing information in the EGR for groups with decision centre in the EU-EFTA, year 2022

	All MNE groups	MNE groups with more than 3 legal units	MNE groups in the CSI index
NACE	4.3%	0.7%	0.2%
Employment	4.8%	0.8%	0.0%
Net turnover	93.2%	31.1%	71.3%
Total assets	94.9%	94.9%	86.4%

Use of new data sources for the EGR

Following the strategic decision to improve the completeness and accuracy of the data available in the EGR, in particular to increase the possibility to disseminate statistics on MNE groups from EGR, Eurostat has started to search for additional data sources and to concretely work on their integration. The availability of additional data sources has several benefits:

- filling in the missing variables at MNE group level (e.g., consolidated turnover, total assets, and global employment);
- improving the delineation of the MNE groups (e.g., additional control relationships between legal units);
- supporting the monitoring of changes or modifications in the MNE groups (e.g., mergers and acquisitions, etc.).

Since 2023, new data sources have been introduced in the EGR production process. Currently other ones are being investigated. In order to ensure transparency and to better understand the potential benefit a clear process based of four steps has been defined (Figure 5 **Error! Reference source not found.** For each of the steps defined, the EGR team evaluates the results and only when certain criteria are met a decision is taken to invest in the new source.

Figure 5: process steps for introducing new data sources



Figure 5 depicts the general idea of the evaluation process. A clear checklist has been developed to take the final decision. The criteria are the following:

1. The new data source is from an official government body or international organization.
2. Other NSIs (or international organizations) are already using the new data source.
3. The new data source is more frequently updated than the other sources currently used in EGR.
4. The new data source contains units not captured by other sources currently used in EGR.
5. The new data source contains more information that is relevant (e.g., net turnover) to the EGR.
6. The new data source contains the same information available in another source, but it reduces the financial cost associated with the collection and processing of the data.

Using this approach, the EGR team has already integrated in the EGR process the *Companies House* data from the British government agency directly. EU and EFTA NSIs are always consulted and informed about the decisions regarding the integration of new data sources in the EGR, and for the moment only concern data covering countries outside the EU have been used (to avoid conflicts with data sent by NSIs). In 2024, for the reference year 2023, the EGR team is evaluating other data sources, such as: (i) *EDGAR* from the Securities Exchange Commission in the US; (ii) *GLEIF* from the Global Legal Entity Identifier Foundation; and (iii) the *OECD-UNSD* Multinational Enterprise Information Platform.

Moreover, the EGR team in collaboration with another Eurostat Unit, is working on the use of public data sources collected using new technological possibilities (e.g., web-scraping data). Wikipedia data have been used for a successful pilot study in (Bitoulas, A., Depire, A., Gayà Riera, P., Laureti Palma, A., Reis, F., & Sopranidis, I., 2024) and recently been expanded as to cover the full top tier MNE groups selected by the CSI index.

The current focus in the use of additional data sources is, as mentioned above, to provide supporting information for the EGR producers. However, one important key element of some of the new data sources which the EGR team is analysing, is the possibility to collect economic variables beyond the current scope of the EGR. Regular EGR users have expressed their interest to have more information at group level. This is something that the EGR team plans to analyse in the near future, with the possibility to include new additional variables (e.g., other elements of the balance sheet, like liabilities) as well as the possibility to provide information on minority ownership (i.e., voting rights below 50%).

Data available from the international collaboration to end tax avoidance, the so-called base erosion and profit shifting (BEPS) data, is another potential source of information which could be integrated into the EGR soon. BEPS data provides information about cross-border transactions within MNE groups. Integrating this information into the EGR or using it to complement some of the missing information, is already being investigated by the EGR team.

4. Dissemination of statistics on MNE groups from EGR

The EGR is a database with confidential microdata, data that is used solely for statistical purposes. The microdata is restricted to national statistical institutes and national central banks that produce official statistics in the EU Member States and EFTA countries. However, aggregated data in the form of experimental statistics⁵ is made available to the general public.

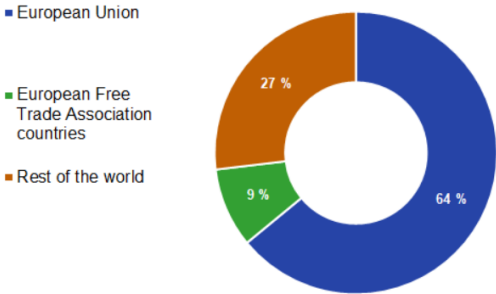
The data currently available covers information about MNE groups and their employment across EU and EFTA countries. Information by NACE activity and by region or country of control is depicted. Moreover, initial calculations of employment concentration at industry level are presented based on MNE groups data.

In addition to the tables available in the Eurostat website, a set of Statistics Explained articles based on the EGR data are released and regularly updated, see for instance (Eurostat, 2024a). This article in

⁵ Experimental statistics are not regulated. The publication of tables and articles aims to grasp on potential user needs and to seek for feedback before switching to official statistics.

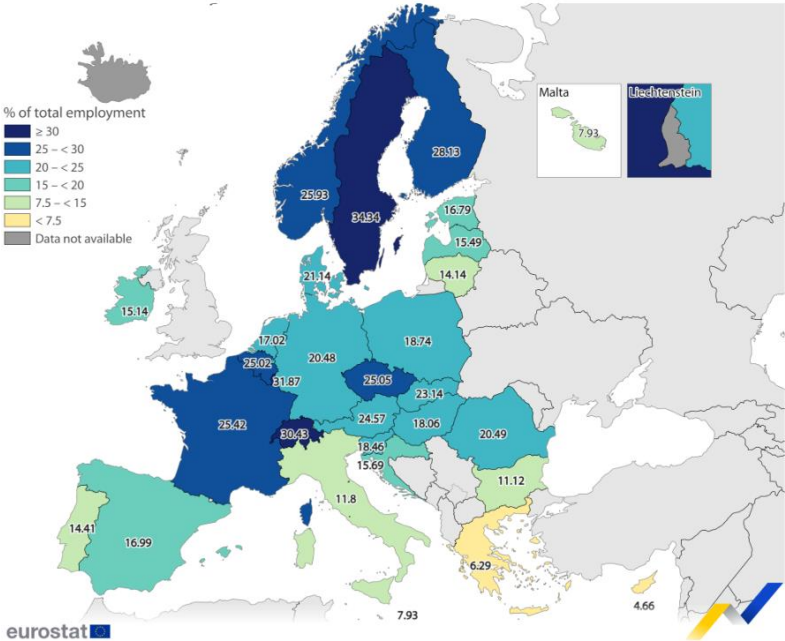
particular, making use of the EGR data, describes the main structural characteristics of MNE groups with activities in the EU and EFTA countries. It looks at their controlling structure, their size, economic activity and geographical presence and influence. Information like the one shown in Figure 6 is available in (Eurostat, 2024a).

Figure 6: MNE groups in the EGR by controlling region, 2022



Collaborations with other European Commission Directorate Generals (DGs) and other stakeholders are essential to clearly identify the statistical needs of policymakers. The EGR team worked together with DG Employment (EMP), having a with a special interest in the structure, activity, and employment of the largest MNE groups⁶ and as a result released the article (Eurostat, 2024b). Information on employment, as shown in Figure 7 was extracted from the EGR statistical frame.

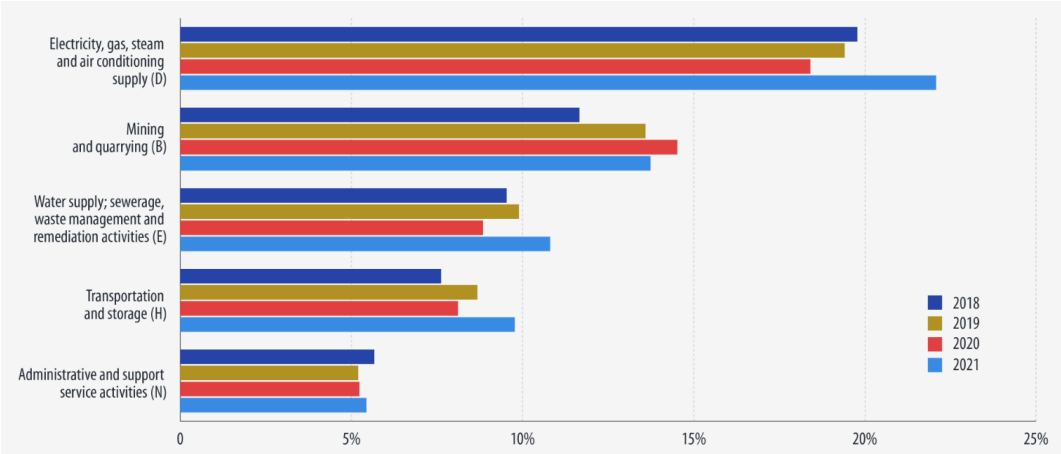
Figure 7: share of people employed in large MNE groups in EGR, 2022



⁶ These are MNE groups employing more than 1 000 people in EU and EFTA countries and having more than 150 people employed in at least two EU and EFTA countries.

The collaboration with the DG Competition (COMP) was also key for the compilation of industry concentration indices at EU level, which preceded the publication of the article (Eurostat, 2024c). The top 5 activities with the highest concentration in the EU can be seen in Figure 8.

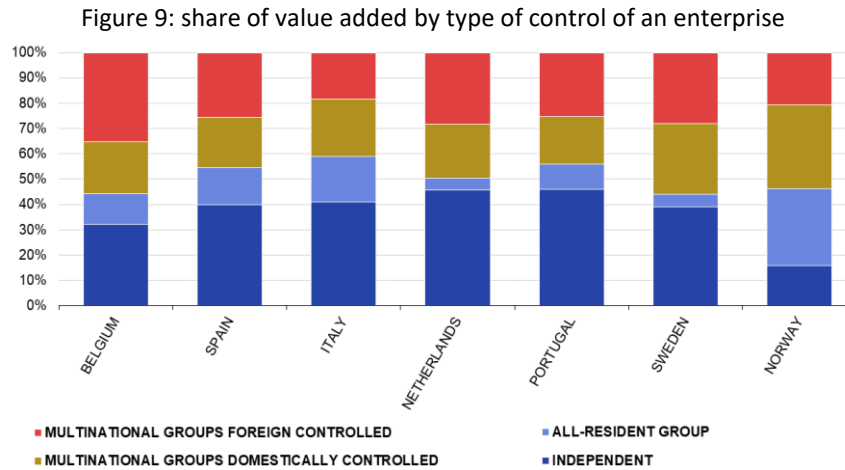
Figure 8: top 5 economic activities with the highest employment concentration, in %



Additional bilateral contacts with other policy DGs have already been established, including DG Taxation and Customs Union (TAXUD) and DG for Internal Market, Industry, Entrepreneurship, and SMEs (GROW), for potential future releases of aggregated statistics on MNE groups and independent or affiliates to a MNE groups SMEs.

The EGR data can also be used for other analytical purposes using microdata linking (MDL)⁷ methods to link the information on enterprises available in structural business statistics (SBS) or other domains, to the national statistics business registers and to the EGR. A recently published Statistics Explained article using the SBS and EGR was recently released as experimental statistics; see (Eurostat, 2024d). An example of the analysis carried out by the MDL technique can be seen in Figure 9, that presents SBS value added for a limited number of countries, broken down by the type of control of the enterprises (independent, or dependent – being a part of a domestic or MNE group) and country.

⁷ MDL is a recognized and powerful method, which open the possibilities to provide new statistics or breakdowns without increasing the burdens usually linked to the collection of additional data.



The picture shows the highest impact of enterprises part of national and international enterprise groups on total value added for all countries analysed. 1010

5. Conclusions

The EuroGroups Register serves as a core statistical infrastructure for globalization and business statistics. Tasked by the Business Statistics Director Group (BSDG), a dedicated Task Force supported Eurostat to enhance its timeliness, frequency and accuracy to fully implement its role as authoritative source in globalization statistics, as required by the EBR Regulation 2019/2152 and by an increasing number of statistical users and policy DGs of the Commission.

A two-tier approach in the EGR allows the focus on a cost-effective and high-quality profiling of the most important MNE groups for the European economy. The Complexity and Statistical Impact (CSI) index guides the selection process of the top tier MNE groups.

The introduction of an early initial frame at T + 4 months facilitates earlier data incorporation, and it is considered the first step toward more timely data for the users and an event-driven model.

Enhancing data completeness and accuracy remains pivotal for the EGR's utility. Integrating additional data sources, including public data, aims to fill gaps, improve delineation, and monitor changes within MNE groups.

While microdata remains restricted to statistical users only, aggregated statistics are disseminated to the public and policy DGs of the European Institutions via Eurostat's website, supplemented by informative metadata and statistics explained articles.

Moving forward, the EGR aims to meet evolving user demands and serve as a cornerstone for the production and dissemination of globalization statistics on MNE groups.

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