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Enterprise Group Register and delineation of Enterprise units

Introduction

Due to many and various factors, and in particularly globalization, it has become increasingly difficult to measure the economy of business. Production of goods, trading and services, within an enterprise, can be distributed over several units and sometime outsourced to subcontractors. The route financial transactions flow can differ from the supply-flow-route of goods. The role of National borders are of less importance as Enterprise Groups choose to allocate the factors of production in a way that is most efficient from an economic, quality and a customer perspective.

To face those challenges, statisticians have to develop and implement new approaches. Business profiling will be important as an activity to identify and delineate statistical units and for better understanding of large and complex Enterprise Groups. A high quality for national BR, including information on enterprise groups, is imperative for the purposes of profiling.

To address the challenges Statistics Sweden has launched a program with the aim to increase consistency and to improve the quality of Business Statistics (BS). The initiatives aim to improve the coherence and coordination between Structural Business Statistics (SBS), Short Term Statistics (STS) and National Business Register (NBR).

As a part of this program, this paper will describe the on-going work on improvement and developing of a national Enterprise Group Register (NGR) and automatic delineation of Enterprise (ENT) from enterprise group.

1. An overview of ongoing developing in national Enterprise Group Register

The National Business Register (NBR) serve as the backbone of business statistics production and will, in the context of the consistency program for improvement of BS, be subject to several major initiatives for improvements. Among other initiatives too reviews of statistical units have started: Kind of Activity Unit (KAU) and the Enterprise unit (ENT). Further, there is an on-going project on re-engineering the NBR, in an attempt to improve the quality of the content and technicality of the system, to meet the requirements of internal users. The improvement work will be closely related to the establishment of the EuroGroups Register (EGR), and the establishment of the EGR population and its multinational groups, in collaboration with Eurostat. The ambition is too, in parallel, to construct and maintain a National Enterprise Group Register (NGR) including domestic enterprise groups (DEG).

As a system/register, the NGR will be separated from NBR initially. In the future, these two registers should be merged. For that purposes there is a need of solving some (methodological) issues. The timing of information from the sources (EGR, external provider) will not be "up-to-date" comparing to the NBR which is usually a live register. The continuity rules for the enterprise group need also to be (de)find and implemented. The issue of how to incorporate global dimension into the register without creating inconsistency for national needs (e.g. NACE and double coding) is also a challenging area.

The NGR will be an important input for profiling and also for gathering information about the group's activities both domestic as worldwide. Regarding multinational groups, NGR will contain same information as stored in EGR.

During the past years Statistics Sweden (SCB) has been participating in production of the central EGR by providing the input and maintenance. At the time SCB has at the same time conducted own development and improvement of the national environment for NGR. The EGR production has been challenging in the sense that results produced cannot be stored in our own environment. The reason for that is at this moment there is no NGR in place with the ability for maintenance and updating information on the groups from, for example, EGR. Today, SCB has information on the relationships between domestic and foreign legal units (direct parents and/or subsidiaries) from an external provider, without any possibilities to update it.

The process to set up a NGR with continuous maintenance and updating capabilities has been divided into several steps.
The first step, conducted in 2014, was aiming to identify input data and sources that could be used for the creation of the enterprise group. It gave a good insight into the quality of available information. The issue of timing, accuracy and lack of information was obvious. The possibility to merge information from different sources and regular maintenance is a necessity regarding the quality and effectiveness working with enterprise groups and EGR. Since sources use different identification numbers for the legal units within the enterprise group a big challenge was to link the sources. This challenge was solved with support by Eurostat setting up a common id-number, and creating the data base for all legal units (so called EGR Identification Service). It gave SCB opportunity to identify foreign legal units and in that way connect NGR with EGR.

During 2015/2016 have business and validation rules been established regarding what/which variables the sources are allowed to update. Priority rules was set up when multiple sources are allowed to update same variable. Some issues and problems still under review or development need solutions before an implementation is possible. For example: classification of the group, calculation of number of employees and continuity rules for a group.

It is forssen that this development work will continue for two more years, where the whole system with application and data storage will be in place.

2. *Business profiling*

For several years, the Statistics Sweden has conducted national profiling and profiled units are used in the area of SBS/STS surveys and in the NBR. So far, the implementation comprises only the most important enterprises. The largest enterprises have an impact on the total economy around 25 – 30 %, depending on variable in focus (Turnover, Value added, Employment, Production value).

The enterprises are delineated in co-operation with the enterprises themselves (intensive profiling) from a national point of view, and maintained by using information from administrative sources and/or contacts with the enterprise. The current profiling is only done on the "non-financial" sector and that present there is no extension to other sectors foreseen.

The national profiling covers, in addition to Enterprise, also delineation of Kind of Activity (KAU) and Local Kind of Activity units. The number of registered KAU has decreased in recent years due to difficulties to collect complete economic information and to calculate value added in a reliable manner. There is an ongoing project at SCB regarding these issues. The approach is to develop a estimation model and not to use KAU as the unit for observation for all surveys.

After the participating in the Eurostat´s initiative on international (European) profiling, the conclusion was that national profiling should be in focus. An improved national profiling methodology in the cooperation with the other EU member states, would lead to an improved and coherent economic statistic on national level with possible increased opportunity for comparison at EU and international level.

3. *Delineation of Enterprises from Enterprise Group automatically*

One initiative to improve business statistics is the intention to achieve a better compliance with European Commission regulations on SBS and NBR by increasing the quality of the population of enterprises. Currently, a work to find a way of automatic delineation of enterprise unit based on legal structure of enterprise groups is ongoing. The ambition is to implement a combination of manual and automatic profiling.

This work is partly supported and financed by Eurostat. The method for automatic delineation of enterprises which will be used as starting point for this work is developed also by Eurostat in cooperation with some EU member states. It is known as Sogeti method.

In the national Enterprise Group Register (NGR) database there are about 48 800 groups, whereas 80% are domestic. The reference year 2013 is used for the purposes of this study.

National Enterprise Group Register ref. year 2013

Total number of Enterprise Groups	Domestic Groups	Multinational Groups with a Swedish Global Group Head	Multinational Group with a foreign Group Head
48 800	38 400	3 700	6 700

3.1 Approach for delineation of Enterprises automatically

The main purpose of this approach is to find domestic enterprise groups that could be treated automatically as an enterprise. Further, an approach was tested whether it can be used for delineation of enterprises also with information about national parts of multinational enterprise groups.

 The main ambition is to set up an approach that will be quite stable in the sense of "producing" enterprises that not need any manual profiling. The approach have no constrains on the size or complexity of the group. This contradicts to some extent to the suggested European (Sogeti) method, where small and not complex enterprise groups are selected from start as a target population for automatically treatment.

The target population reference year 2013

	Number of Enterprise Groups	Number of Domestic LEU	Number of employed	Percentage of total number of employed in NBR
Total in NGR	48 800	145 000	3 100 000	73 %
Excluded from target population	-12 200	-8 700	-1 360 000	-32 %
Target Population	*36 600*	*136 200*	*1 740 000*	*41 %*

The approach is based on information that can be found in NBR and the current NGR. The definition of the statistical unit enterprise follows the operational rules[1]. The target population is exclusively within nonfinancial sector. Manually profiled enterprises and the groups to which they belong, are also excluded from the population. The same is valid for the enterprises that are divided into kind of activity units (KAU), which are also manually profiled.

According to the enterprise definition, there should not be different sector codes on legal units belonging to an enterprise. Therefore the following solutions are applied to avoid that groups have mixed sector codes. For enterprise groups that are owned by municipalities, or counties, or university, which belong to different sector then the rest of the legal units within the same group, the top of the group is not included in the process. Instead, the process starts from its subsidiarity´s on the next level. In this way, for example enterprises within energy distribution owned by municipalities are not excluded from the target population.

3.1.1 Description of the process

Starting with control relationships found in the NGR database, a top-down approach is used. The approach uses three variables for determination of which legal units to combine into one enterprise. These are employment, turnover and most important activity code (first NACE). This also means that legal units which have a large secondary activity will not be considered. A consequence is that some KAUs maybe are hidden.

The top-down approach creates the enterprise unit from 'parent LEU' through the ownership of 'sub LEU' units. The condition is that, if both have same NACE code or one of them have an ancillary NACE code, they will be linked together in one ENT. The linking process will stop if the conditions are not fulfilled. For example, if there is a difference in NACE code classification.

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[1] Definition of Statistical Units as in CR 696/93: Statistical Units definitions Operational rules for its implementation as developed by the Task Force Statistical Units

If the process stops at a parent LEU, it will start again and try to create a new Enterprise unit together with the subsidiary LEUs. It means that the approach can generate more than one Enterprise unit in same Enterprise Group automatically.

All other variables such as employment and turnover are aggregated. The turnover figures will in the next step be used to determine if aberrant NACE codes maybe are ancillary activities.

In reality, the operational organisation of the enterprise group can be differently from the legal structure and control relationships. One part of the group can operationally belong to another distant part/legal unit of the group.

The algorithm runs the conditions in loops but cannot look sidewise in the group. This means that it runs only top down in the line of the structure (vertical integration). This is one possible downside of the approach, but despite this and still with its complication, the approach provides useful results.

3.1.2 Handling the ancillary activities in the process

Next step is to identify and integrate the ancillary NACE into the main NACE when identifying pairwise relationship from "parent LEU" to "subsidiary LEU" in a top down approach. In this case determination is done by comparing the turnover from the subsidiary LEU unit, with "suspicious" ancillary NACE code, with the turnover aggregated from the subsidiary LEU and its parent LEU. If this turnover is less than 10 % of the total turnover, then the subsidiary LEU is considered to be an ancillary unit, and will be integrated into the enterprise getting the same NACE as the parent LEU. For NACE code 46 (Wholesale trade, except of motor vehicles and motorcycles), the percentage was set to 60%.

This process is repeated, LEU by LEU, the complete way through legal structure until the lowest level or until conditions are not met, so the process is stopped.

If the NACE of the next subsidiarity is different or cannot be considered as ancillary (higher than the percentage limit of total turnover), then it will not be combined into the same enterprise. It will be regarded as an autonomous enterprise.

The quality of information from NBR regarding the NACE 642 (holding) and 701 (head offices) as well as correct sector code are crucial prerequisites for the approach. The rules for when a LEU can be classified as holding or headquarter has been clarified and improvements were carried out instantly in the NBR.

Also regarding the rest of the suspicious ancillary activities, improvements will be needed.

As a consequence, the approach may not be perfect in detecting the ancillary units, but it will reflect the reality in the better way than in the present situation regarding the register and business statistics.

NACE codes to be considered as ancillary is a result of the approach used by testing countries[2] , the list provided by the document on Operational Rules for SU and own experiences of ancillary codes present in the NBR and SBS.

List of suspicious ancillary NACE codes

Description	NACE	Percentage limit of total turnover
Wholesale trade, except of motor vehicles and motorcycles	46	60 %
Other retail sale of new goods in specialised stores	4778	10 %
Freight transport by road	4941	10 %
Warehousing and storage	5210	10 %
Support activities for transportation	522	10 %
Computer programming, consultancy and related activities	62	10 %
Data processing, hosting and related activities; web portals	631	10 %
Activities of holding companies	642	10 %
Trusts, funds and similar financial entities	643	10 %
Other activities auxiliary to financial services, except insurance and pension funding	6619	10 %
Real estate activities	68	10 %
Accounting, bookkeeping and auditing activities; tax consultancy	6920	10 %
Activities of head offices; Management consultants activities	70	10 %
Architectural and engineering activities; technical testing and analysis	71	10 %
Advertising and market research	73	10 %
Rental and leasing activities	77	10 %
Activities of employment placement agencies	781	10 %
Temporary employment agency activities	782	10 %
Services to buildings and landscape activities	81	10 %
Office administrative and support activities	821	10 %
Activities of call centers	822	10 %
Packaging activities	8292	10 %
Other business support service activities n.e.c	8299	10 %

To determine whether there is an ancillary activity present or not, is difficult and complicated problem to solve. Our experience is that, the ancillary NACE codes and the percentage limit regarding the proportion of the total turnover, works well with the exception of one NACE code.

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[2] European (Sogeti) method tested by Denmark, Finland, France and Netherlands

The NACE code 46 has shown to be problematic, giving quite different impact on the delineation of enterprise. Often this activity is regarded as primary activity and not as ancillary. One explanation may be that part of the sales is not manufactured by the enterprise or the group to which the particularly LEU belongs. In order to "fit" in the approach, the percentage limit of NACE 46 is significantly higher than for the rest of the economic activities. For that reason, NACE 46 needs more evaluation/investigation.

3.2 Preliminary findings

The approach created approximately 42 750 Enterprises of 136 200 LEU. The result confirms that the approach works. With further evaluation and improvements the approach could be useful. The ability to consolidate data will be important for the final conclusion.

Preliminary findings from delineation of ENT from enterprise groups:

	Number of delineated ENT	Number of Enterprise Groups	Number of LEU	Number of employed	Percentage of number of employed
Domestic ENT group = Enterprise	19 600	19 600	44 200	235 000	13 %
All Swedish LEU in a MNE group = Enterprise	1 350	1 600	3 800	53 000	3 %
ENT group or the Swedish part of an group = 2 Enterprises	15 000	7 500	39 100	357 000	21 %
ENT group or the Swedish part of an group ≥ 3 Enterprises	6 800	7 900	49 100	1 095 000	63 %
Total Target Population		**36 600**	**136 200**	**1 740 000**	**100 %**

The result will require further evaluation, mainly for the groups with more than three created enterprises. Some of them, when the approach suggests that the groups are complex from activity perspective, may be transferred to the groups of manual profiling. Further, it is to be evaluated if the created enterprises consist of large secondary activities.

The test of this approach results in movements between, as well as inside, NACE.. The number of enterprises decreasing significantly more in division D (Electricity, gas, steam and air conditioning supply), K (Financing and insurance) and L (Real estate) but not so much in expected divisions like N (Administrative and support activities). It may imply that groups, particularly, in division D and L have homogenous main activity and thus is not so complex.

Division K is a typically ancillary activity if it is represented in a non-financial group. However, also division N can be regarded as ancillary although the number of enterprises has not decreased as much as expected. There could be at least two explanations. There are many small enterprises in the division not belonging to any Enterprise Group and therefore not a subject for automatically profiling. The second explanation could be that SCB already classifies enterprises as ancillaries belonging to the NACE they serve.

4. *Consolidation of collected data*

The earlier mentioned European (Sogeti) method also includes various consolidation methods. The project will test them and compare with current data.

The main activities for the test are:

- Consolidate turnover automatically, calculate production value and value added, by using SBS data or other administrative data.
- Add up the variables for LEU concerned in the bullet point above without consolidation.
- Further variables to add up will be wages and salaries and number of employees

- Compare the results with the consolidated data on the highest level consolidation unit.

This will be done during autumn 2016, why no result can be reported yet.