Geography of Expenditure
Executive Summary
Work Package 13

Ex post evaluation of Cohesion Policy programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and the Cohesion Fund (CF)

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Contact: Alida Mihaela Staicu
E-mail: Alida-Mihaela.STAICU@ec.europa.eu

European Commission
B-1049 Brussels
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WP13: geography of expenditure

Authors*: Andrea Ciffolilli, Stefano Condello, Marco Pompili, Roman Roemisch.

*A network of national experts was set up to collect data from the Managing Authorities. These worked under the supervision of and in close cooperation with the authors of this report to collect data and carry out the necessary aggregations or breakdowns to produce country datasets at NUTS3 level. The list of national experts is annexed to the report.

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Executive summary

Context, purpose and tasks

The study on “Geography of expenditure” is one of the Work Packages of the ex post evaluation of Cohesion Policy programmes 2007-2013, and focuses on the European Regional Development Fund (ERDF) and the Cohesion Fund (CF). Its purpose was to collect data on the cumulative allocations to selected projects and the expenditures of both ERDF and CF programmes at the NUTS3 level of EU regions, broken down by 86 priority themes (defined in Commission Regulation No. 1828/2006) covering the Convergence, Regional Competitiveness and Employment (RCE) as well as the European Territorial Cooperation (ETC) Objectives for the period 2007-2013.

The study was organised in 6 tasks: Task 1 – the team explored the data already available, identifying the existing gaps and pitfalls at the NUTS3 level and the 86 priority themes for 2013 and 2014, and then carried out an extensive data collection across the EU28 with the support of a network of national experts. Task 2 – the team developed a methodology to estimate the regional breakdown of allocation and expenditure data in the cases where NUTS3 data could not be obtained. Task 3 – the estimation method was applied to calculate the missing regionalised data which were then combined with the data gathered in Task 1. Task 4 – five maps were produced to illustrate the first results of the study. Task 5 – the team consolidated the constructed database with the database created for the period 2000-2006. Task 6 – the team explored similar data for the period 1994-1999 created by an ESPON study with the aim to verify to what extent it could be used and integrated with the 2000-2014 data at NUTS2 level.

Methodology for data collection

The core team prepared guidelines and templates for data collection that were tested in Austria and Italy and then circulated among the national experts. The guidelines included relevant definitions, instructions on how to approach Managing Authorities (MAs) and compile the templates as well as a data collection programme with milestones and quality control checks. The network of national experts played a key role in liaising with MAs, collecting data, identifying shortcomings, information to be verified, and gaps to be covered through estimation. The core team coordinated the process by setting up a help desk to facilitate the interaction with MAs and provide solutions to methodological issues related to the different monitoring practices and data extraction routines. The collected data were subject to a series of checks to ensure quality and reliability of the database. Inconsistencies emerging from the checks were discussed with the experts and the MAs, where necessary, to identify and overcome problems.

Assembled database before estimation

The assembled database is available in Excel format. It allows searching and aggregating data according to country, programme, fund, EC objective and priority code. The database also includes information on sources and notes at the programme level. These were verified in collaboration with national experts. The database covers 303 programmes and (even before estimation) is a considerable step forwards, in terms of available detail, compared to the 2013 SFC data already available at the Commission. 100% data at NUTS3 level is available for 182 programmes compared to 63 in the 2013 SFC dataset. There is no NUTS3 data only for 25 programmes compared to 169 in the EC data and some NUTS3 details are available for 96 OPs compared to 72 in the existing EC
data. In terms of funding, approximately 93% of the 2013 allocations to selected projects are available at NUTS3 level, and a similar share is available for expenditures and 2014 allocations. Most of the data, about 83% of the total funding in all years, did not involve any breakdown or estimation, as it was directly obtained at NUTS3 level or resulted from aggregation of data provided at a higher level of detail (e.g. project level or Local Administrative Units - LAU, former NUTS4 and NUTS5 levels). A relatively modest share, ranging between 9 and 10% of total funding, was calculated by the national experts in collaboration with the MAs and the team to provide a NUTS3 breakdown starting from lower level of detail (e.g. NUTS2). These calculations were carried out, where feasible, mostly on the basis of project location (for infrastructures) or population distribution (for services). The remaining 7-8% of the total funding could not be broken down in a straightforward way, according to the assessment of the national experts and the MAs, and was therefore estimated through statistical and econometric methods.

**Estimation methodology and completion of final database**

The estimation procedure involved the following steps: 1) Breakdown of NUTS0 data to the NUTS2 level; 2) Breakdown of NUTS1 data to the NUTS2 level; 3) Breakdown of NUTS2 data to the NUTS3 level. That is, the NUTS2 data estimated in Step 1 and Step 2 as well as the original data at the NUTS2 level is broken down to the NUTS3 level. The actual estimation in each step follows a logically consistent decision tree that ensures that the appropriate technique is chosen depending on the characteristics of the data. The set of estimation techniques used in the study are:

- Breakdown by regional shares in total allocations or expenditures; if the NUTS3 share is less than 100% but equal to or higher than 90%, the breakdown of NUTS2 data uses a proportionality assumption and employs only the available NUTS3 data on allocations or expenditures to allocate NUTS2 data.
- Equal distribution; there are rare cases where allocations or expenditures data by priorities are only available at the NUTS2 level, while there is absolutely no allocations or expenditures information at the NUTS3 level. In these cases NUTS2 data are broken down to the NUTS3 level using the assumption of equal distribution.
- Single region estimation; it is applied in the rare cases where NUTS2 data need to be broken down, but allocations or expenditures data are only available for one of the corresponding NUTS3 regions (though the NUTS2 region consists of more than one NUTS3 region). In such cases NUTS2 data are allocated to NUTS3 regions according to the following rule: If the share of the respective NUTS3 region in the combined NUTS2 and NUTS3 allocations or expenditures is higher than 50%, all NUTS2 allocations or expenditures are assigned to this specific NUTS3 region; If the share of the respective NUTS3 region in the combined NUTS2 and NUTS3 allocations or expenditures is equal to or less than 50%, the NUTS2 allocations or expenditures are equally distributed over all NUTS3 regions which form the NUTS2 region in question.
- Proportional or inverse proportional estimation using explanatory variables; there are cases where a NUTS2 region consists of 2 NUTS3 regions only. Econometric estimation in such cases cannot be applied and the allocations or expenditures data of the NUTS3 regions is correlated with the data from explanatory variables, to identify those variables that provide a best prediction of the NUTS3 allocations or expenditures data. The list of explanatory variables at each NUTS level
includes: Population, GDP volume, GDP per capita, Gross Value Added, employment and productivity of agriculture, manufacturing, industry, construction, services as well as the respective totals, population density and a measure of employment rate.

- Econometric estimation. If the number of NUTS3 regions is larger than 2, the workhorse method is to econometrically estimate the expenditure or allocations as a function of 1 or 2 explanatory variables. In a first round, a distribution model with one explanatory variable is estimated, and in a second round a distribution model with two explanatory variables is estimated, whereby each combination of variables is tested. From the two rounds, the model with the highest adjusted R2 is used as the basis for the breakdown of NUTS2 data (or NUTS0 or NUTS1 data).

The estimated data was subject to consistency checks. Hence for each stage of the estimation it was checked whether the estimated results corresponded in their sum to the original data. The checks indicated that the estimation procedure works well in terms of consistency with the original data. If not already available at the NUTS3 level, CBC programme data were distributed according to the NUTS3 region population share. The final database, after estimation, is available in Excel form in two versions: at NUTS3 and NUTS2 levels.

**Illustrative maps**

The result of the data collection and estimation process is illustrated in five maps. The first map is a general map showing the territorial dimension of cumulative expenditures 2014 for infrastructure, productive investment and human capital at NUTS2 level. For this, the 86 intervention priorities were aggregated to the three broad categories. The other four maps show cumulative regional expenditures in: transport, environment, research and business support.

**Consolidation with 2000–2006 data**

The data collected for the 2007-2013 programming period was combined with similar data collected for the 2000-2006 period to produce a consolidated database covering the regional ERDF and CF investments from the year 2000 to the year 2014, at NUTS2 level. The consolidated database contains data from Objective1/Convergence, Objective 2/RCE and the Cohesion Fund. Some adjustments were necessary to match NUTS codes in the two datasets. Although a common set of priority themes had to be identified to allow consolidation, the consolidation has some limitations. Most notably, while in the 2007-2013 data, both allocations and expenditures data were collected as such at the source, for the 2000-2006 data, only commitments were collected at the source. 2000-2006 expenditure data was not available and payments were estimated using the absorption rates by country and fund. The data in the consolidated database is an interesting starting point for a longer-term analysis of the EU Cohesion Policy and its effects. Inter alia, it makes it possible to identify shifts in the regions’ ERDF and CF investment strategies as is illustrated in the maps included in the report. A first general overview map shows the changing ERDF and CF investment patterns for three broad categories ‘Environment’, ‘Infrastructure’ and ‘Productive investment’. The map suggests that in most EU regions ‘Productive investment’ has gained importance in ERDF and CF investment from the 2000-2006 to the 2007-2013 period, while ‘Environment’ declined. The additional maps reveal that the increase of ‘Productive investment’ is largely due to a strong increase in RTD share in total ERDF and CF investments, on the contrary, the
business support share in total commitments/allocations tends to decline in most regions. As far as infrastructure investments are concerned, there has been a general shift toward energy investments. Finally, quite an interesting core-periphery pattern in tourism emerged, as the peripheral regions tended to invest more ERDF resources in 2007-2013.

Investigation of 1994-1999 data

The last section of the report is an analysis of the 1994-1999 data produced by an ESPON study, aiming at assessing the feasibility of using this data to create a single time series 1994-2014, especially for Objective 1/Convergence regions. The 1994-1999 dataset contains data only on expenditures and is characterised by several shortcomings such as: expenditure is not uniform across countries and programmes (e.g. in some cases official data was used; in other cases planned and unofficial expenditure was included); incomplete figures (only a subset of objectives and funds were considered); data were manipulated in some cases but it is not clear when and how; lack of information on cohesion objectives; spending typologies do not reflect topics; ERDF and CF are not separable from the totals etc. As a result, any attempt to consolidate the ESPON dataset with the 2000-2013 data must accept these limits and be aware that the series cannot be fully comparable. The highlighted limits are likely to reduce the reliability and robustness of the data. However, whether a single series with such limitations is still acceptable and useful is likely to depend on the potential users and on the purposes it is used for. The last paragraph of the report summarises the features of the two databases and provides some suggestions on how to reconcile them and on relevant caveats.