



HELLENIC REPUBLIC



HELLENIC STATISTICAL AUTHORITY

GENERAL DIRECTORATE OF STATISTICAL SURVEYS
DIVISION OF NATIONAL ACCOUNTS

METHODOLOGY OF COMPILATION OF REGIONAL ACCOUNTS

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GENERAL REMARKS

The Hellenic Statistical Authority (ELSTAT) announces the National Accounts results on the level of Region (NUTS II), regarding Gross Value Added for the years 2000-2013. Data are compiled according to the European System of Accounts ESA2010 and are consistent with the respective annual national figures.

On 26 June 2013, the Regulation (EU) No 549/2013 of the European Parliament and of the Council on the European System of National and Regional Accounts in the European Union - ESA 2010 was published in the Official Journal of the European Union (L 174/1). The new European System of National and Regional Accounts (ESA2010) replaced ESA 1995, in order for the national accounts to be adapted to the new economic environment and developments in methodological research, as well as to users' needs.

In accordance with the provisions of Regulation (EU) 549/2013 pertaining to the data transmission program, the new system of National Accounts (ESA 2010) is required to be implemented also for the compilation of regional accounts for the period starting from 2000 onwards.

The sources and methods used for the compilation of regional GVA by industry classification are listed below:

Section A – AGRICULTURE, FORESTRY AND FISHING

For Agriculture, the basis for the estimation of regional Gross Value Added is the Agricultural Regional Accounts, which record the value of production (at basic prices) and intermediate inputs per product. The main sources for the compilation of the Agricultural Regional Accounts are: 1) the census Annual Statistical Agricultural Survey regarding the quantities of production and intermediate consumption and 2) the Ministry of Rural Development and Food regarding the average national prices. These data are available in detail per product.

For Forestry, the regional allocation of GVA is based on the regional structure of the output value, which is calculated as “quantity x price”. Data on the output quantities of forestry products are obtained from the General Secretariat for Forestry of the Ministry of Rural Development and Food.

For Fishing, the regional allocation of GVA is carried out according to the regional structure of the production in quantities, based on the following surveys: The Monthly Statistical Survey of Sea Fishing, the Annual Agricultural Survey and the Quarterly Statistical Survey of Aquaculture and Fish Farming.

Section B – MINING AND QUARRYING

The regional allocation of GVA is performed based on the regional structure of data (output, intermediate consumption) from the census Structural Business Statistics (SBS) survey on the local establishments of enterprises with 10 or more persons employed. Enterprises with less than 10 persons employed were surveyed using a sample until reference year 2007, and from reference year 2008 onwards it was replaced by a sample survey with the enterprise as the surveyed unit, the national GVA development of this industry is used for the estimation of the regional GVA for the years 2008 onwards.

Section C – MANUFACTURING

As in the case of mining, the surveyed unit in the SBS has changed from 2008 onwards from the local establishment to the enterprise. Calculations are made with the use of SBS data from the sample survey with the enterprise as the statistical unit. Enterprises were split into multi-regional big, uni-regional big and small enterprises. GVA of multi-regional enterprises is allocated to regions based on wages and salaries of employees per local unit. GVA of uni-regional big and of small enterprises is compiled based on Small Area Estimates. The Small Area Estimation Method is an estimation method that combines the average GVA of each region and of each size class, which results from SBS with the population of enterprises per region and per size class from the Business Register and it is used due to the fact that SBS has not been designed for regional purposes and additionally its results are affected by non-response. (For Small Area Estimation Method see Annex I).

For Nuts III level, the regional allocation of GVA is based on the regional structure of employment from the Labour Force Survey (LFS) only of the years 2008-2013, due to differences between Nace Rev. 1.1 and Nace Rev. 2 in this industry.

In cases of Nuts II or Nuts III levels with volatile results - the case for Attiki and two neighboring regions - data are smoothed, using moving averages.

Section D – ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY

The income method is applied: GVA is split into its main components; gross operating surplus and compensation of employees. Gross operating surplus is allocated to regions according to the electricity production in kWh per Nuts III level. The regional allocation of compensation of employees is based on the regional structure of wages and salaries of this industry according to data from the Social Security Fund. From national data, under Nace Rev. 2, there is no separate estimation for gas GVA, so this sub industry is treated together with electricity. It should be noted that gas in Greece is imported.

Section E – WATER SUPPLY; SEWERAGE; WASTE MANAGEMENT AND REMEDIATION ACTIVITIES

National GVA is allocated to regions based on the regional structure of GVA as it resulted from the census Annual Water Survey.

Section F – CONSTRUCTION

For the regional structure of GVA of construction industry regional distribution of total hours worked is used provided from LFS and corrected for regional differences in wages by the average wage per hour from SBS (as a proxy for labour productivity).

For Nuts III level the volume (in m³) taken from building permits is used for the regional allocation of GVA.

In cases of Nuts II or Nuts III levels with volatile results, data are smoothed using moving averages.

Section G – WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES

SBS data are used. Enterprises are split into multi-regional big, uni-regional big and small enterprises separately for wholesale and retail trade. GVA of multi-regional enterprises is allocated to regions based on wages and salaries of employees per local unit. GVA of uni-regional enterprises is taken directly from the SBS results. GVA of small enterprises is compiled based on Small Area Estimates. The Small Area Estimation Method is an estimation method that combines the average GVA of each region and of each size class that results from SBS with the population of enterprises per region and per size class from the Business Register and it is used due to the fact that SBS has not been designed for regional purposes and additionally its results are affected by non-response.

For Nuts III level the regional allocation used is the one that results from the Small Area Estimates for the whole industry.

Section H – TRANSPORTATION AND STORAGE

SBS data are used, treated separately for each 2-digit activity code (Land transport and transport via pipelines, water transport, air transport, warehousing and support activities for transportation, postal and courier activities). For water and air transport the income method based on the main elements of GVA (compensation of employees and gross operating surplus) is applied: use of wages and salaries as regional indicator for compensation of employees and use of physical indicators (passengers and freights) for the regional allocation of gross operating surplus. For each of the other activities of this industry the enterprises were split into multi-regional big, uni-regional big and small enterprises separately. GVA of multi-regional enterprises is allocated to regions based on wages and salaries of employees per local unit. GVA of uni-regional and small enterprises is taken directly from the SBS results (for small enterprises, the imputed results are used).

At Nuts III level, for land, water and air transport physical indicators are used for the regional allocation, while for warehousing and support services and postal and courier services employment data (from LFS and the Social Security Fund respectively) are used.

In cases of Nuts II or Nuts III levels with volatile results, data are smoothed using moving averages.

Section I – ACCOMMODATION AND FOOD SERVICE ACTIVITIES

SBS data are used. Enterprises are split into multi-regional big, uni-regional big and small enterprises separately for hotels and restaurants. GVA of multi-regional enterprises is allocated to regions based on wages and salaries of employees per local unit. GVA of uni-regional enterprises is taken directly from the SBS results. GVA of small enterprises is compiled based on Small Area Estimates. The Small Area Estimation Method is an estimation method that combines the average GVA of each

region and of each size class as resulted from SBS, with the population of enterprises per region and per size class from the business register and it is used due to the fact that SBS has not been designed for regional purposes and additionally its results are affected by non-response.

For Nuts III level, the regional allocation used is the one that resulted from the Small Area Estimates for the whole of the industry.

In cases of Nuts II or Nuts III levels with volatile results, data are smoothed using moving averages.

Section J – INFORMATION AND COMMUNICATION

The activities classified under the 2-digit codes (Publishing, Video Production, Programming and Broadcasting, Telecommunication, Computer Programming and Information service activities) of the Information and Communication industry are treated separately. Two main sources are used for the regional allocation of GVA: SBS and employment data from the Social Security Fund.

For Publishing, regional results are based on GVA from SBS taking into account the multi-regional enterprises for the year 2008 (for multi-regional enterprises GVA is allocated according to wages and salaries per local unit). Due to differences between Nace Rev.1.1 and Nace Rev.2 there were comparability problems with the data of the previous years in Nace Rev 1.1. For this reason the regional structure of 2008 is used for the years 2000-2007. For the year 2009-2013, GVA from SBS are used, taking into account wages and salaries of the local units for multi-regional enterprises.

For the activities Video Production, Programming and Broadcasting the indicator used is the regional allocation of employees based on data from the Social Security Fund.

For Telecommunications, regional results are based on GVA from SBS taking into account multi-regional enterprises (for multi-regional enterprises GVA is allocated according to wages and salaries per local unit).

For Computer Programming and Information Services activities the indicator used is the regional allocation of wages and salaries from SBS taking into account multi-regional enterprises). Due to differences between Nace Rev.1.1 and Nace Rev.2 there were comparability problems with the data of the previous years in Nace Rev 1.1. For this reason the regional structure of 2008 is used for the years 2000-2007. For the years 2009-2013, wages and salaries from SBS, taking into account multi-regional enterprises.

At Nuts III level, the regional distribution of GVA is based on the regional structure of total employment from LFS for the years 2008-2013 (only these years were available in Nace Rev.2) and extrapolated backwards for the years 2000-2007.

In cases of Nuts II or Nuts III levels with volatile results, data are smoothed using moving averages.

Section K – FINANCIAL AND INSURANCE ACTIVITIES

The activities classified under the 2-digit codes (financial Services Activities, except Insurance and Pension Funding; Insurance, Reinsurance and Pension Funding, except Compulsory Social Security; Activities Auxiliary to Financial Services and Insurance Activities) of the Financial and Insurance Activities industry are treated separately.

For Financial service activities, except insurance and pension funding the regional allocation is based on the regional structure of wages and salaries of bank employees, which resulted from the census survey on banks.

For Insurance, Reinsurance and Pension Funding, except Compulsory Social Security, the regional indicator used is based on the employment data from the Social Security Fund.

For Activities Auxiliary to Financial Services and Insurance Activities - where self-employment is important - GVA is allocated to regions according to the regional structure of total employment from LFS.

In cases of Nuts II or Nuts III levels with volatile results, data are smoothed using moving averages.

Section L – REAL ESTATE ACTIVITIES

Regional results for 2000-2013 were compiled from National Accounts, in the framework of the recent revision, at Nuts III level based on census 2001 data, combined with data from new permits – demolitions, as well as data from the Household Budget Survey (HBS) and the Consumer Price Index (CPI).

Data for the years 2000-2004 are extrapolation of 2001 and for 2006-2013 are an extrapolation of 2005 regional results. The extrapolation is based on the development of the stock of dwellings.

Section M – PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES

GVA is split into compensation of employees plus gross operating surplus and mixed income. For compensation of employees plus gross operating surplus, wages and salaries from SBS are used as regional indicator, while for the regional allocation of mixed income the basis is the number of self-employed from SBS.

At Nuts III level, the regional distribution of total employment based on LFS is used.

In cases of Nuts II or Nuts III levels with volatile results, data are smoothed using moving averages.

Section N – ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES

GVA is split into compensation of employees plus gross operating surplus and mixed income. For compensation of employees plus gross operating surplus, wages and salaries from the Social Security Fund are used as regional indicator, while for the regional allocation of mixed income the number of self-employed persons from LFS is used, namely the structure of the years 2008-2010, due to differences between Nace Rev. 1.1 and Nace Rev. 2 for these activities.

In cases of Nuts II or Nuts III levels with volatile results, data are smoothed using moving averages.

Section O – PUBLIC ADMINISTRATION AND DEFENSE; COMPULSORY SOCIAL SECURITY

The regional distribution key for GVA is the regional structure of employment from LFS, corrected by a correction factor for the wage level. This factor is the average, for the years 2000-2010, wage per employee of the local government sub-sector of the public administration. Regional data on wages for the section began to be available from 2011 and onwards. (Single Payment Authority)

Section P – EDUCATION

The regional distribution of GVA is compiled separately for private primary and secondary education and public primary and secondary education and is based on the regional distribution of employment from the Annual Census Survey of educational institutions. For universities, the basis for the regional allocation of GVA is wages and salaries.

Section Q – HUMAN HEALTH AND SOCIAL WORK ACTIVITIES

The industry was treated separately for public and private health. For public health, the regional allocation of GVA is based on the regional structure of wages and salaries of public hospitals. For private health, the regional allocation of GVA is based on the regional Nuts II structure of hours worked from LFS and on the regional Nuts III structure of administrative staff and nurses from the annual census of clinics and health centers, corrected by the number of doctors based on information from medical associations.

Sections R, S and T – ARTS, ENTERTAINMENT AND RECREATION, OTHER SERVICE ACTIVITIES, ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS AND SERVICES PRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE

These three industries were treated together due to significant transfers between activities from Nace Rev. 1.1 to Nace Rev. 2. The regional results for both Nuts II and Nuts III are based on the regional distribution of total employment from LFS for the years 2008 onwards (years for which results are available at Nace Rev. 2) and adjusted for the years 2000-2007 by a correction factor for Nace Rev.2.

In cases of Nuts II or Nuts III levels with volatile results, data are smoothed using moving averages.

Section U –ACTIVITIES OF EXTRATERRITORIAL ORGANIZATIONS AND BODIES

The Hellenic Statistical Authority does not provide data on this industry.

1. Symbols

h: enterprise size class according to the turnover or the total employment as follows:

Trade			
2005-2007		2008	
No of class	Turnover size classes in €	No of class	Turnover size classes in €
1	0 – 99.999,9	1	0 – 99.999,9
2	100.000 – 399.999,9	2	100.000 – 399.999,9
3	400.000 – 1.399.999,9	3	400.000 – 1.399.999,9
4	1.400.000 – 4.999.999,9	4	1.400.000 – 4.999.999,9
5	5.000.000 – 14.999.999,9	5	5.000.000 – 14.999.999,9
6	15.000.000 – 29.999.999,9	6	15.000.000+
7	30.000.000+		

Hotels and Restaurants					
2005-2007			2008		
Group	No of class	Turnover size classes in €	Group	No of class	Turnover size classes in €
55A	1	0 – 109.999,9	55A	1	0 – 109.999,9
	2	110.000 – 299.999,9		2	110.000 – 299.999,9
	3	300.000 – 599.999,9		3	300.000 – 599.999,9
	4	600.000 – 1.119.999,9		4	600.000 – 1.119.999,9
	5	1.200.000+		5	1.200.000 – 4.999.999,9
				6	5.000.000+
55B	1	0 – 59.999,99	55B	1	0 – 59.999,99
	2	60.000 – 129.999,9		2	60.000 – 129.999,9
	3	130.000 – 299.999,9		3	130.000 – 299.999,9
	4	300.000 – 899.999,9		4	300.000 – 899.999,9
	5	900.000+		5	900.000 – 1.999.999,9
				6	2.000.000+

Manufacturing / Mining and Quarrying	
2008	
No of class	Employment size classes in persons
1	1 – 4,99
2	5 – 9,99
3	10 – 19,99
4	20 – 49,99
5	50 – 99,99
6	100 – 249,99
7	250+

N_{grh} : number of enterprises of NUTS III level g, belonging to the size class h, of the NUTS II level r

The number of enterprises (N_{grh}) comes from the enterprises register data.

\bar{X}_{rh} : weighted average of turnover for enterprises of NUTS II level r, belonging to size class h.
Meaning:

$$\bar{X}_{rh} = \frac{\sum_i w_{rhi} \cdot x_{rhi}}{\sum_i w_{rhi}}$$

where w_{rhi} is the imputation factor of enterprise i, belonging to size class h, of NUTS II level r
and x_{rhi} is the turnover of enterprise i, belonging to size class h, of NUTS II level r

\bar{Y}_h : weighted average of GVA for enterprises belonging to size class h. Meaning:

$$\bar{Y}_h = \frac{\sum_r \sum_i w_{rhi} \cdot y_{rhi}}{\sum_r \sum_i w_{rhi}}$$

α_h : the ratio of the average GVA to the average turnover for the size class h. Meaning:

$$\alpha_h = \frac{\bar{Y}_h}{\bar{X}_h}$$

2. Estimation of GVA at NUTS III level

$$\hat{Y}_g = N_{grh} \cdot \bar{X}_{rh} \cdot \alpha_h$$

3. Remarks on the estimation method

The estimation of GVA according to Small Area Method is considered as highly accurate, because it doesn't include the outliers.

The sum of the values of all NUTS III levels of the country $\sum_g \hat{Y}_g$ is possible to be different from the respective value as it was compiled from the SBS surveys \hat{Y}_{SBS} . In order to coincide these two values, the value of each NUTS III level extracted by this method should be multiplied by the following correction factor:

$$C = \frac{\hat{Y}_{SBS}}{\sum_g \hat{Y}_g}$$