GDP – AN INDICATOR FOR STATISTICAL COMPARISONS AT NATIONAL / REGIONAL AND INTERNATIONAL LEVEL

Ph.D. Senior Lecturer, Gheorghe SĂVOIU
University of Piteşti

Abstract

All European Union countries have gradually adopted and harmonized their statistics to meet the directives of the **European System of Accounts** (ESA), whose 1995 version replaced the 1979 version, thus providing the necessary methodological comparability of regional indicators for regional Community rankings.

ESA is the same as **National Accounts Statistics** (NAS), as a type of complex algorithm of accounting, statistics and macroeconomic analysis, being used as a tool for defining economic outcomes and also as a major decision-making target in the economic syntheses of market economy countries, in UN statistics, as well as those of other international bodies.

Keywords: National Accounts Statistics (NAS), European System of Accounts (ESA), statistical comparisons, purchasing power standard (PPS), regional GDP per capita, regional dispersion of GDP.

***

The system of **National Accounts Statistics** (NAS) is a system of statistical and accounting management, a coherent, quantitative, aggregative, concrete and simplified set of accounts and tables through which the items are arranged that are necessary for the calculation of macroeconomic indicators (among which GDP remains essential, as a universal referential) and for the analysis of the economic activities in a national economy (including its regional aggregations) in a given reference period (usually a year or a quarter, the exception is provided by the U.S. economy, where the month is the constructive benchmark of SCN analysis). *NAS remains the most comprehensive financial solution of the requirements of knowing the economic mechanism of a national economy and its development regions. NAS is a complex statistical and accounting tool, which shows the fundamental balances (supply – use) in a national economy and its regional "mezo-economies".*

Comparability of the macroeconomic indicators of NAS and ESA implies simultaneously ensuring harmonized and systematic methodologies, a single currency and a selected base year / reference unit.

Same or similar methodologies as a goal of optimizing comparability involves improving all the price indices use, whether in the sphere of industrial production (industrial production and the price index of industrial production), the sphere of foreign trade (foreign trade and index unit value), the wide area of distribution (goods and services market, and the consumer price index), or the breaking down of macroeconomic aggregates concerning the results (the factor or index of deflation, and more frequently used, GDP deflator). If the base year, or reference year is ultimately just a matter of choice or consensus in the spirit of methodological harmonization, evaluation in a single currency involves two types of attitudes, according to the number of countries or states, i.e. binary and multilateral comparisons. The single currency is achievable using two methods: **the average exchange method, and the method of purchasing parity of national currencies against the U.S. *dollar* (NAS) or *euro* (ESA).**

The exchange rate method is the method of converting synthetic indicators of the national currency by the exchange rate. Assessing the macroeconomic indicators in a single currency based on official exchange rates is a method easy to apply, but which can affect negatively the real values, as exchange rates do not typically reflect the purchasing power of currencies, for several reasons: Primarily, due to the partiality of the object of the method, since it is determined based on the products covered by foreign trade, and other elements of the nature of international economic and financial transactions. Secondly, because real exchange rate may change a lot with no significant changes in the amount of production, expenditure, consumption, changes in economic development, especially due to long-term capital migration.

The method of purchasing power parity of currencies is an alternative to the exchange rate method. In order to have relevant results, since the 1970s the International Comparison Programme was applied, which was built based on purchasing assessing the power parities of national currencies. PPC represents the number of currency units needed to purchase, in a given country, the same amount of goods that can be obtained with one monetary/currency unit of the base country (the U.S. dollar for the International Comparisons Programme, or the Austrian shillings for the European Comparison Programme). The method of assessing the macroeconomic indicators in a single currency consists in using a number of price indices calculated starting from the prices of material goods and services in the country that does the comparison calculations and the prices of the same goods and services in the country whose currency it was decided to use in order to express the macroeconomic indicators. The basis of these price indices was based on the general principles of calculating interpreter indices. PPC is the average ratio between the prices in the country

to be compared and those of the country taken as a basis of comparison for a large number of expenditure categories composing GDP, broken down from the global items (final household consumption, collective government consumption, gross fixed capital formation, changes in inventories and net exports), a ratio resulting from the analysis of a „standard basket" of goods and services for an average family of 4. SEC, and therefore the EU Statistical Office (EUROSTAT), expresses the purchasing power parities with the *standard purchasing parity* (PPS), determined for each national aggregate, so that at EU level, through aggregation, the GDP thus obtained should coincide with that expressed in the single currency. This method is preferred in the regional analyses within UE.

Both methods are criticized based either on the fact that an exchange rate is the result not only of current demand, but also of capital movements for purposes of obtaining benefits from the differences in rating, and the standard consumption basket for one family of four, underlying the process of purchasing parity, is artificial. The spatial and temporal detail presentation solutions lie in the regional and quarterly solutions of building SCN and SEC, giving other comparability criteria, particularly useful in the Community (the new methodologies SCN 1993 and SEC 1995 secure them rigorously). In Romania, during the EU pre-accession period, bilateral comparison was made through an intermediary, generating multilateral comparisons. The multilateral comparisons began by solving the issue pf choosing a *standard*, and continued by passing through successive binary stages ($F^P_{A/B}$; $F^P_{B/C}$); in the end, since it is a known fact that not even the Fisher index answers test of circularity, two methods compelled recognition, whose names were the abbreviations of their authors' initials, i.e. the GK method (Geary Khamis), and the EKS method (Eltetes, Kovecs, Sculz). The GK method combines exchange rates in order to determine initial sets of average prices with physical volume indices, resulting in determining purchasing power parity, which recommends it for structural analyzes based on the absolute data obtained; while the EKS method combines the use of both direct and indirect indexes, and proved to be more appropriate, between the compared countries, to calculate the indices of GDP and of the main aggregates, compared individually. The statistical information on the results of the GDP type, according to ESA, are relevant in many specific assessments of regional or territorial indicators, allowing comparisons, rankings, analyses and interpretations of social cohesion, of sustainable development or human development. The relevance of the ensuring comparative evaluations in ESA and the descriptive statistical analysis of data concerning regional GDP in the 2009 recession (latest year available EUROSTAT statistics to ensure comparability) are presented in the table below:

Comparable descriptive statistics of regional GDP for EU27 and Romania

Descriptive statistics	*GDP* – RO Regions Million EUR*	*GDP** – RO Regions PPS per inhabitant*	Descriptive statistics	GDP* – EU27 Regions Million EUR	GDP**– EU27 Regions PPS per inhabitant
Mean	*14761.62*	*11587.50*	Mean	42574.10	22612.92
Median	*13130.00*	*9800.000*	Median	28120.00	22000.00
Maximum	*29304.00*	*26100.00*	Maximum	561957.0	78000.00
Minimum	*9437.000*	*6900.000*	Minimum	1295.000	6400.000
Std. Dev.	*6122.361*	*6066.168*	Std. Dev.	52689.11	8462.082
Skewness	*1.909715*	*1.976368*	Skewness	4.730116	1.665925
Kurtosis	*5.307671*	*5.428078*	Kurtosis	39.19125	10.88789
Jarque-Bera	*6.637797*	*7.173227*	Jarque-Bera	16150.28	827.9053
Probability	*0.036193*	*0.027692*	Probability	0.000000	0.000000
Sum	*118093.0*	*92700.00*	Sum	11793025	6128100.
Sum Sq. Dev.	*2.62E+08*	*2.58E+08*	Sum Sq. Dev.	7.66E+11	1.93E+10
Observations	*8*	*8*	Observations	277***	271***

Data sources: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tgs00005 and http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tgs00003

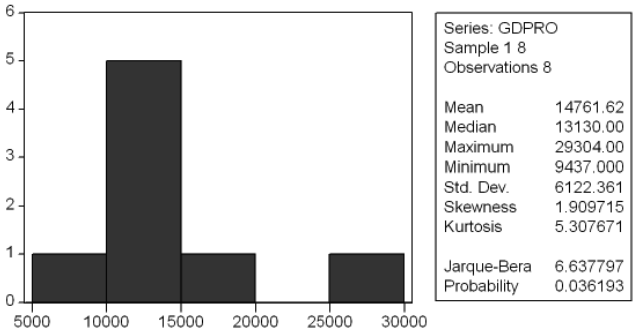
*Note: Regional gross domestic product (PPS per inhabitant) by NUTS 2 regions of Romania and EU

**Note: Regional gross domestic product (million EUR) by NUTS 2 regions of Romania and EU

***Note: Total regional comparable and accessible data for 2009 on http://epp.eurostat.ec.europa.eu are different.

A first and optimistic consequence of this comparative analysis, is related to Romania's regional data on GDP, which are close to the limit of homogeneity and generate a series of normally distributed data in keeping with the values of the Jarque-Bera test, both through the analysis using the method of exchange rate (GDP per region in million euro):

Histogram and descriptive statistics of regional GDP in Romania in 2009, (in million euro)

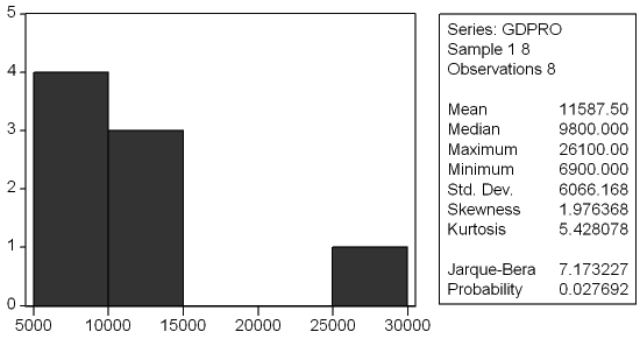


Source: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tgs00003 Regional gross domestic product (million EUR) by NUTS 2 regions of Romania.

Note The available data in million euro, for 2009, accessed in January 2013, were processed by the author using Eviews software.

and the method of standard purchasing power parity, expressed in PPS (purchasing power standard) per capita:

Histogram and descriptive statistics of regional GDP in Romania in 2009, PPS (purchasing power standard) per capita

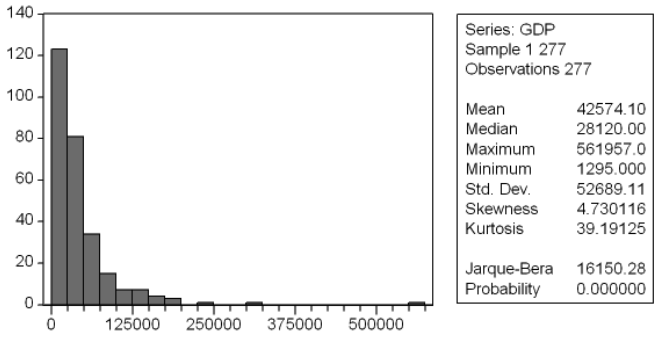


Source: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tgs00005 Regional gross domestic product (PPS per inhabitant) by NUTS 2 regions of Romania.

Note: The available data in million euro, for 2009, accessed in January 2013, were processed by the author using Eviews software.

A second consequence of that comparative analysis, as interesting as the former, identifies an excessive heterogeneity and an abnormal distribution of EU regional data on GDP, according to the very high values of the Jarque-Bera test, both in the analysis through the exchange rate method (GDP per region in million euro),

Histogram and descriptive statistics of regional GDP in EU in 2009, (in million euro)

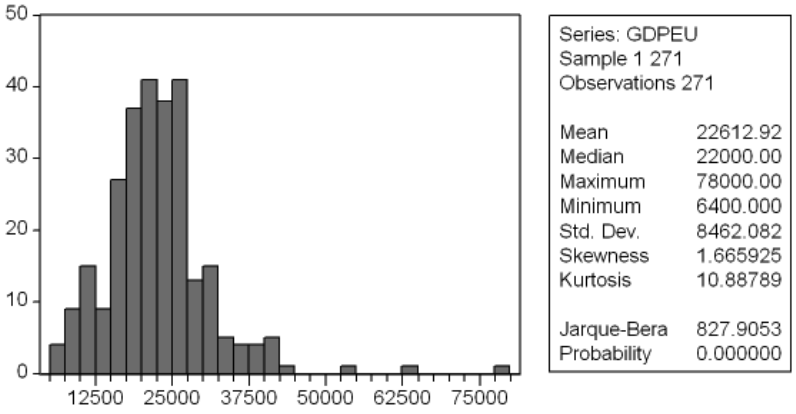


Source:http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tgs00003 Regional gross domestic product (million EUR) by NUTS 2 regions of EU.

Note: The available data in million euro, for 2009, accessed in January 2013, were processed by the author using Eviews software.

and through the method of purchasing power parity standard (PPS) per EU inhabitant:

Histogram and descriptive statistics of regional GDP in EU in 2009, PPS (purchasing power standard) per capita



Source:http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tgs00005 Regional gross domestic product (PPS per inhabitant) by NUTS 2 regions of EU.

Note: The available data in million euro, for 2009, accessed in January 2013, were processed by the author using Eviews software.

The regions in EU-27 are strongly polarized as to regional GDP and, against the background of a both excess of heterogeneity, asymmetry and the arching of the data series, the abnormality of distribution is evident. EU, conceived as a union of its regions, is still far from its ideal of union homogeneity through macroeconomic results, and the convergence processes have to be accelerated, even against the backdrop of the relatively recent global recession. The average of regional GDP in Romania is about 35% of the EU-27 average, but there is relatively homogeneity, although the gap of 82% between, for instance, the North-East region and Bucharest - Ilfov warns of rising polarization, which tends to be more and more serious:

Regional gross domestic product in Romania, in 2009

Romania's regions	GDP RO Million EUR	GDP RO (PPS per inhabitant)	GDP RO (in % of the EU27average)
Nord-Vest	13637	10100	43
Centru	13450	10700	46
Nord-Est	12810	6900	29
Sud-Est	12452	8900	38
Sud - Muntenia	15405	9500	40
Bucuresti - Ilfov	29304	26100	111
Sud-Vest Oltenia	9437	8400	36
Vest	11598	12100	52

Data sources:

http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tgs00003

http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tgs00005 and

http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tgs00006

The publication of the macroeconomic indicators of SNA and ESA results is achieved temporarily, at the end of the reference period, with a semi-definitive character, up to 9 months or 1 year distance, and finally at nearly two years from the reference period (in the publication titled *National Accounts*, edited by NIS and NBR, as well as other statistical yearbooks published and Romania and the EU). Although there is a late character of the final indicator, GDP remains an indicator of both national and regional impact for statistical comparison and structural and homogeneity analysis of the economic results within the European Union and in any of its member countries.

Conclusions

Statistical analysis reveals a positive aspect, namely a homogeneous structure in regions of Romania, a regional structure rigorously achieved for over two decades in national statistics, and which generated substantial databases in point of volume and utility in carrying out regional policies of convergence, partially proven, among other things, by the descriptive statistics. Romania has reached, at the end of the recent global recession, the fifth place in the EU, with 37%, among the countries with high percentages of the value of the dispersion of regional GDP per capita, coming after Bulgaria (46.7%), Hungary (44.1%), Estonia (43.8%) and Latvia (43.3%).

The implications of this analysis bring forward the need for a more coherent and realistic policy of convergence in the medium and long term,

intended to reduce the gap in relation to the development of the EU-27, rather than a restructuring into new regions, which can only bring additional costs and hence regional economic results of an even poorer level.

Bibliography

- Aglietta M., (2001). *Macroeconomie financiară,* Editura C.N.I. Coresi S.A., Bucureşti, pag.18.

- Drăgan, C.M. (2012). *Ştiinţa conturilor naţionale*. Editor Asociaţia Europeana de Studii.

- Dobrotă, N. (coord), (2001). *Dicţionar de economie*, Ed. Economică, ed a III-a, pag. 147

- Korka, M,Tuşa, E.(2004). *Statistică pentru afaceri internaţionale,* Ed. ASE, Bucureşti, pag. 29.

- Isaic-Maniu, A., Mitruţ, C.,Voineagu,V., Săvoiu, G. (2002). *Statistica afacerilor*, Ed. Independenţa Economică, Piteşti, pag. 88-89.

- Munteanu. C.. Horobeţ. A. (2005). *Finanţe transnaţionale.* Ed. All Beck. Bucureşti.

- Săvoiu, G., (coord.), (2009). *Econometrie,* Editura Universitară, Bucureşti, pag. 68-69 şi 78-79.

- Săvoiu G.,Grigorescu R. (2003). *Statistică financiară*, Ed.Independenţa Economică, Piteşti, pag. 84 – 87.