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ECONOMIC PECULIARITIES OF THE ROMANIAN TISA RIVER BASIN

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ABSTRACT – A possible answer to the current challenges of the Tisa catchment area, correlated with water management, social and economic development, environmental conservation, is the transnational initiative of the five countries drained by the tributaries of the Tisa River. In this context, the spatial development has a major impact on the Romanian Tisa catchment area by providing the economic cohesion. The purpose of the present paper is to define the current status of economy in the Romanian Tisa River Basin, through the filter of achieving the level of competitiveness claimed by the national, European, or global authorities. By setting several quantitative indicators, analyzed for a standard territorial level (NUTS 3), for a definite time interval (2002-2007), those more or less competitive economic branches, activities or aspects of the analyzed territory were identified, and, at the same time, the elements that "hinder" development, the traditional remnants, or the existing entrepreneurial initiatives. On the basis of relevant indicators, the calculation of an index of competitiveness was proposed at territorial level, the results certifying a certain level of competitiveness for the region under consideration.

Keywords: competitiveness, economic development, index of competitiveness, Romanian Tisa River Basin, Lisbon Strategy

INTRODUCTION

The Tisa catchment area, extended over the territory of five countries, Romania, Ukraine, Serbia, Hungary, and Slovakia, covering a territory of approximately 158,000 km², has drawn the attention of the officials and professional members of the Council of Europe Conference of Ministers responsible for Spatial/Regional Planning (CEMAT), who launched the initiative of a cross-border partnership aiming at solving various aspects related to spatial development, environmental protection and water resources.

The Romanian Tisa River basin, area under analysis in the present study, overlying the central-western half of the country, includes the upper Tisa, Someş-Crasna, the Criş rivers, Mureş-Aranca-Ier and the Bega catchment areas and approximately 70% of the total area of the entire Tisa River Basin.

Some of the concrete results of the research on the economy of the Romanian Tisa River Basin, research initiated within the transnational project entitled *Tisa Catchment Area Development (TICAD),* are reflected in the present study, dedicated to the analysis of the economic status of the territory, investigated from the competitiveness viewpoint. The general objective of the paper is to determine the current economic status as a result of the combination of some premises related to the use of resources, tradition, and innovation.

The specific objectives can be grouped as follows:

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- establish a working methodology and select the relevant indicators for determining the level of territorial competitiveness;
- underline the general macroeconomic framework, the registered deficiencies, the strengths of certain economic activities;
- analyse, in a concrete manner, the economic indicators that show a true picture of the employment degree, of the entrepreneurial environment, the industry performance or innovation trends in economic sector;
- calculate the index of competitiveness of the analysed territorial system, its spatial representation, and determine the degree of competitiveness at the county level;
- validation of the hypothesis (invalidation or confirmation) launched in the research methodology.

METHODOLOGY

Analysed area

The designation of the territory has generally followed the hydrographical delimitation; however, the spatial clippings were made according to the administrative borders to match the territorial units for statistics. Thirteen counties were included in the analysed territory, totalizing 1,006 administrative-territorial units and a population of over 6 million inhabitants.

Table 1. *Administrative classification of the studied territory*

Territory	Administrative-territorial units (NUTS levels, NUTS codes)	
Romanian Tisa River basin	NUTS0	Romania (RO)
	NUTS1	Macroregion 1 (includes the North-West and the Centre Regions) and Macroregion 4 (includes the West Region) (RO1)
	NUTS2	North-West Region (RO11), Centre Region (RO12), West Region (RO42)
	NUTS3	Bihor County (RO111), Bistrița-Năsăud County (RO112), Cluj County (RO113), Maramureș County (RO114), Satu Mare County (RO115), Sălaj County (RO116), Alba County (RO121), Harghita County (RO124), Mureș County (RO125), Sibiu County (RO126), Arad County (RO421), Hunedoara County (RO423), Timiș County (RO424)
	NUTS5	1006 Communes, cities and towns
	LAU-2	4664 Component settlements

Working hypothesis

By stating the general objective of the paper, that of determining the current economic status of a territory, marked by a series of disadvantages but also strengths, the paper seeks to demonstrate a hypothesis whose validation is directly conditioned by the indicators taken into account and by their availability, namely: *Capitalizing a strong tradition in the development of economic sectors and branches, the economy of the Romanian Tisa River Basin is characterized by a competitive economy*.

Regardless of the approached perspective, competitiveness aims at enhancing the inhabitants' standard of living, increasing productivity and the employment of human resources. Analysing the European and international reports, competitiveness can be measured by a series of indicators, provided that they can be accessed, the heterogeneity of the data deriving from their unavailability in the official statistics. Without adopting a certain model from the reports dedicated to the analysis of competitiveness, due to a set of data missing at regional or county level, some of the indicators relevant for the economic development of a territory have been selected (Table 2).

The attempt to validate the launched hypothesis is based also on resolving questions such as:

- What is the contribution of agriculture to the territorial economic development?
- Are there intensive relations of collaboration between the stakeholders in charge of economic development?
- Can the entrepreneurial environment created in the analysed territory sustain its economic development?

Table 2. *Benchmark indicators of the economic development of the Romanian Tisa Basin*

Name of indicator	Indicator measuring instrument/ Sub-indicators	Objective	Territorial level of reference	Source
1.Productivity	1.1. Gross added value	Measure the economic power of a region	NUTS2	INSSE
	1.2. GDP	Determine the economic efficiency	NUTS3	INSSE
	1.3. GDP/capita	Determine the inhabitants' standard of living	NUTS3	INSSE
	1.4. Productivity, by activity branches (*only the productivity of secondary sector is available)	Measure the competitiveness of the region and assess the human potential	NUTS3	INSSE
	1.5. Level of agricultural technology (no. of tractors, no. of harvesters)	Determine the needs and the possibilities to increase the production capacities	NUTS3	INSSE
2.Human resources	2.1. Occupational structure of the population, by activity branches	Determine the inhabitants' preference for a particular type of economic activity and the employability of the workforce	NUTS3	INSSE
	2.2. Number of unemployed persons	Determine the social performance of the territory	NUTS3	INSSE
	2.3. Unemployment rate	Present the weaknesses in the labour market Select the diversification degree of occupations and Highlight certain attitudes of attitudes of discrimination	NUTS3	INSSE
3.Active economic agents	3.1. Number of active companies, by activity branches	Reflect the degree of specialization Determine the capacity of an economy to produce high-tech goods and services	NUTS3	INSSE, Trade Registry, Ministry of Finance
	3.2. Number of SMEs	Determine the occupancy degree of human resources	NUTS3	INSSE, Trade Registry, Ministry of Finance
4.Ecological agriculture	4.1. Patented agricultural products	Select the opportunities to relaunch agriculture	NUTS0	MADR
5.Research & development	5.1. Rate of researchers	Highlight the degree of support for research and innovation activities	NUTS3	INSSE
	5.2. Total expenditures from research activity	Determine the development potential of the economy based on knowledge and technology	NUTS3	INSSE
	5.3. Number of submitted patent applications		NUTS3	INSSE
6.NGOs	6.1. Share of NGOs, by activity fields	Highlight the degree of participation of civil society in spatial development and in promoting the access to information	NUTS3	StrawberryNet
7.Modern retail market	7.1. Number of modern retail units	Degree of adaptation to market requirements	NUTS3	Revista Piața
8.Business infrastructure	8.1. Number of industrial parks	Determine the increase in the number of jobs and the volume of direct foreign investment	NUTS3	County Councils
9.Land use	9.1. Share of agricultural area in total area agricultural land	Identify the human pressure on land use	NUTS3	INSSE
	9.2. Density of LSU/100 ha agricultural land	Determine the degree of land capitalization	NUTS3	INSSE
10.Agricultural structure and production	10.1. Structure of cultivated land	Determine the degree of specialization of agriculture and producers	NUTS3	INSSE
	10.2. Livestock structure	Highlight the existing livestock diversity and specialization and establish local zoning	NUTS3	INSSE
	10.3. Plant production	Determine the economic efficiency of the territory	NUTS3	INSSE
	10.4. Animal production		NUTS3	INSSE

Methodological norms

As regards the methodological aspect of validating a hypothesis, the following aspects were necessary to be taken into account:

- the *designation of a set of indicators and sub-indicators*, as well as the setting of some objectives for each sub-indicator, which seeks to capture the general economic features, economic specialization, existing competitive disparities, openness towards high-tech, etc.;
- the *time interval* taken into consideration includes the period between 2002 and 2007 for most of the indicators, this interval offering a uniformity of the data supplied by the institutions in the territory. Exceptions to this rule are represented by some indicators registered in official statistics for the current or previous year (e.g. NGOs, top companies, industrial parks);
- *NUTS 3* was chosen as the *territorial benchmark level* as most of the indicators could be analyzed in terms of collected data. The uncertainty of some data, their lack of centralization at the level of the responsible institutions, the lack of data homogenization within the administrative-territorial units led to the analysis of certain indicators at national or regional level (number of individual agricultural holdings);
- the authenticity of the indicators' values is provided by the *official, national data source*, as well as electronic data sources and, for comparative analyses, the EUROSTAT data.

Based on the analyzed list of indicators, the most relevant indicators were selected and a *competitiveness indicator* was proposed, where the variables in question are the share of population employed in agriculture, share of population employed in services, share of employed population, rate of researchers, unemployment rate, GDP per capita, productivity in industrial sector. The values obtained indicate a certain degree of competitiveness for each county included in the territory under consideration.

RESULTS

General economic context of the Romanian Tisa River Basin

By extension and by the presence of an important number of medium and large-sized towns, the analysed territory cumulates an important segment of the national economy. The analysis of some economic parameters comes to support, as it will be presented below, both the importance of the analysed territory in the national context and the manner of its integration.

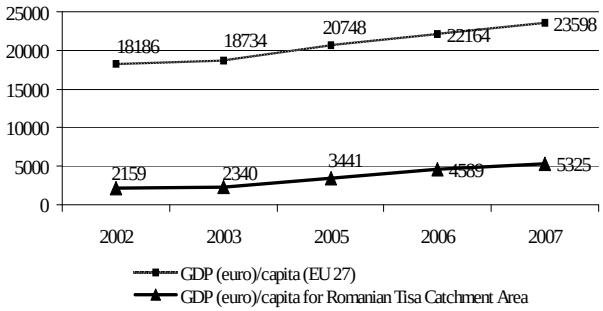


Figure 1. *GDP (euro) per capita (2002-2007)*
(Source: National Institute of Statistics, EUROSTAT)

As in the case of national economy, **gross domestic product** has registered a continuous increase in the interval under consideration, so that in 2007, its value was approximately 2.5 higher than the value for 2002, in the conditions in which the increase of the GDP in the European Union (27) was 1.2 times higher. This trend was within the national picture of the evolution of GDP, the growth placing Romania up to the 17 rank in the 2006 European rankings (place also maintained in 2007, when the GDP value was 121 billion euros), with a value of 96.9 billion euros out of which the analysed territory contributed with almost 1/3 (i.e. 30,012,051,535 euros). The territorial differences of this indicator are significant, both as regards the values registered in 2007 and the increase between 2002 and 2007. In 2007, the highest values of the GDP were registered in the counties of Timiş and Cluj, each of them with more than 5 billion euros, while counties such as Satu Mare, Harghita, Bistriţa-Năsăud and Sălaj did not exceed 1.6 billion euros.

Unfortunately, as the indicator **GDP per capita** puts Romania on the last places in the European rankings, in the case of the analysed territory this indicator reflects a poor economic condition, the value registered in 2007 being of 5,325 euros per capita. It must be remarked however that it is an encouraging trend for the above-mentioned interval, a reduction of differences taking place from 8.42 times in 2002 to "only" 4.43 times in 2007, in rapport with the European average. At territorial level, it appears that, in 2007, the value of this indicator ranged between 4,096 euros per capita in Maramureş and 8,464 euros per capita in Timiş County.

The contribution of the various economic branches to the formation of GDP presents important differences, the highest share belonging to services (52%), followed by industry (38%) and agriculture (10%); the contribution of the local economic sectors to the national GDP varies between 43% in the case of agriculture, 37% industry and 21% in the case of financial intermediaries.

Gross value added registered a trend fluctuating over time and differentiated at sectoral level. Thus, the intervals 2003-2004 and 2005-2006 registered increases of the GVA indicator, followed immediately by decreases in the following intervals: 2004-2005 and 2006-2007. Such an evolutionary pattern is specific to some economic sectors such as agriculture, hunting and forestry, extractive industry and manufacturing. There are, however, economic sectors that do not comply with the general pattern. This category of peculiar evolutions includes food industry, textile, wood, chemical, ore-processing industry, whose landmark common with the general pattern is represented only by a peak associated to 2004, while 2005 is marked by an omnipresent decrease. Atypical evolutions occurred in the field of constructions, with a continuous increase, and in the electronic and optic equipments, where the peak was represented in 2005, as well as in the fields of education and health, where the common note was given by the maximum decrease registered in 2006, with values that fell under the levels registered in the previous years.

Human resources

One of the most important resources with economic valences, namely population, presents a series of peculiarities. The aspects regarding the occupational structure and the employment of the labour force are presented here.

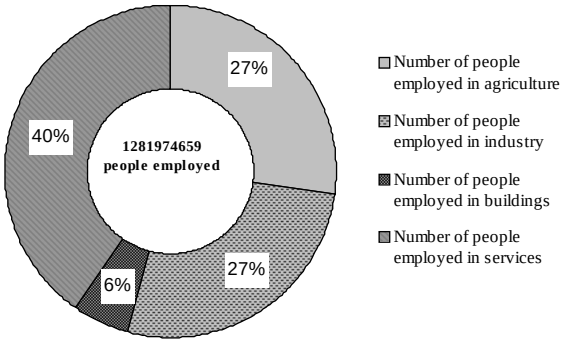


Figure 2. *Share of employed population by sectors (2007)*
(Source: National Institute of Statistics)

The overall restructuring carried out in the national economy was reflected in the analysed area also, in multiple facets, including the **occupational structure of the population**. The evolution of this indicator in the interval under consideration is characterized by a numeric decrease in agriculture (-159,700 persons) and industry (-13,100 persons), while increases were registered in construction (+55,100 persons) and services (+235,900 persons). In these conditions, in 2007, the highest share belonged to services (40% of the total occupied population), while agriculture and industry registered 27% each and constructions 6% of the total employed population. The analysis of the employed population by sectors at county level allows the emphasis of the following peculiarities: *employed population in agriculture* has the highest share in Maramureş County (38%) and the lowest in Sibiu County (16%); *population employed in industry* has the highest share in Arad County (32%), while the lowest value is registered in Cluj County (22%); *population employed in constructions* has the highest share in Cluj County (8%), while the lowest value is registered in Sălaj County (3%); *population employed in services* has the highest share in Cluj County (48%), while the lowest value is registered in Satu Mare County (32%).

It follows that the most important differences in the occupational structure are recorded in agriculture and services, namely the sectors that have a significant contribution to the modern characteristics of the economy of a territory.

Besides the distribution of human resources by economic sectors, very useful in assessing the competitiveness of an economy is the number of unemployed, reflecting the capacity of the territorial system to absorb the labour force (economic vivacity), on the one hand, and the capacity to reconvert professionally the persons seeking employment (socio-economic improvement), on the other hand. For 2007, the **number of unemployed** was highly differentiated, from 10,691 in Mureş County to 3,105 in Bistriţa-Năsăud, while **unemployment rate** varied from 5.7 in Alba County to 1.6% in Timiş County. The latter indicator shows a positive situation, both in relation to the national average (6.4%) and in relation to the EU average (7.1%).

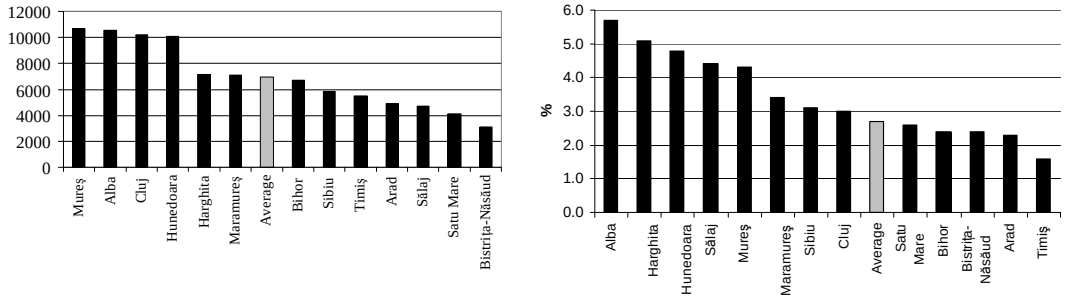
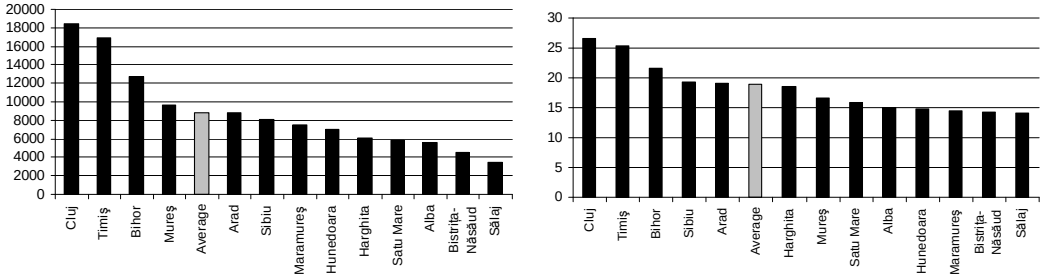


Figure 3. *The registered unemployed (a) and the unemployment rate (b), by county (2007)*
(Source: National Institute of Statistics)

Entrepreneurial environment

Reflecting an amount of general legal and political conditions, as well as a series of local factors (e.g. fiscal facilities, real estate and infrastructure facilities), **the number of active economic agents** represents an indicator of prime importance in the economic characterisation of the analysed territory. If, as regards the number of active agents a series of significant differences can be observed (in 2007, for instance, the greatest number was registered in Cluj County – 18,406 and the smallest number was registered in Sălaj County – 3,409), as regards the increase of their number at county level, values are much more grouped, ranging between 1.36 (Harghita County), 1.37 (Mureş County) and 1.53 (Sălaj), 1.54 (Arad).



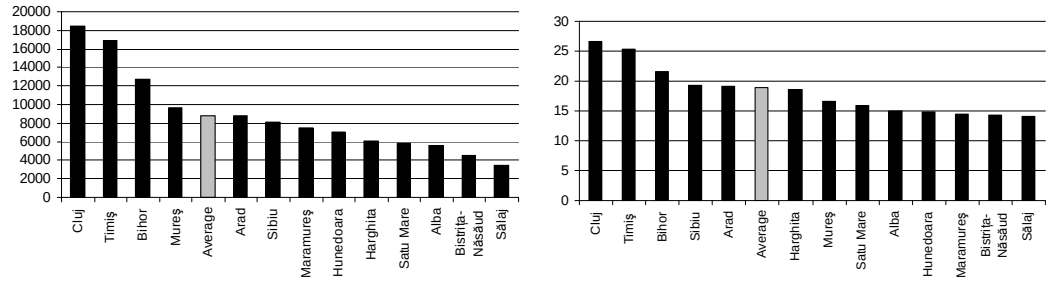


Figure 4. *The number of companies (a) and the number of companies/1000 inhabitants (b), 2007*
(Source: Data processed according to the information provided by the Ministry of Finances, National Institute of Statistics and the Trade Register)

Labour productivity registered, in accordance with the national evolution, a continuous increase in the analysed interval, so that, in 2007, the value of this indicator was 2.5 higher than in 2002. The highest value is associated to Alba County (3.3), while Arad County registered the lowest increase of labour productivity. In 2007, the highest value of labour productivity was registered in Timiş County (16,825 euros per employee) and the lowest value was registered in Maramureş County (10,581 euros per employee). In rapport with the national average, it is remarkable that, the value of labour productivity was constantly higher for the entire analysed area, reflecting an amount of positive factors, including the degree of technologization and the optimisation of the productive processes.

An important indicator in economic analysis is represented by the affirmation and the development of **NGOs**, mainly of those in the field of environmental protection, social services, education and research, with an obvious spatial development in the counties of Cluj, Timiş and Sibiu. The economic analysis also included the **spatial distribution of modern retail units**, noticing the presence of the great European commercial groups that tested successfully the Romanian market by opening some shopping chains of food and non-food products and some shopping networks of stores providing local products (according to *Piaţa, the Magazine of consumer goods, July 2010*).

Role of agriculture in the context of rural development

Agriculture represents a basic branch of the regional economy, both by the tradition of its affirmation, being the oldest occupation, and by expansion, share, and productivity of activities that characterise it.

The distribution of **land fund** by use indicates that the agricultural land represents 60.7%, forested areas 31.4%, and other areas 7.8%. Out of the total agricultural areas, more than half of the area is used as arable land, followed by pastures (about 20%), grasslands, vineyards and vine nurseries, and orchards. As regards the Romanian Tisa catchment area, there is a clear proportion to the situation at national level, the area of lands remained the same between 2002 and 2007, namely 8,270,074 ha, but the structure of agricultural lands underwent slight changes: decreases in area appeared in the case of agricultural lands (5,109,392 ha, in 2002 → 5,025,215 ha, in 2007), pastures (1,558,817 ha, in 2002 → 1,490,646 ha, in 2007), grasslands (902,788 ha, in 2002 → 899,617 ha, in 2007), vineyards and vine nurseries (30,779 ha, in 2002 → 25,054 ha, in 2007), orchards and orchard nurseries (74,338 ha, in 2002 → 62 247 ha, in 2007), the only increases appearing in the case of arable lands (2,542,670 ha, in 2002 → 2,547,651 ha, in 2007) and areas covered by forests and other forest lands (2,526,394 ha, in 2002 → 2,599,335 ha, in 2007).

Land fund structure shows a predominance of agricultural land. Agricultural lands are predominant in all administrative units, the counties of Arad, Timiş, Bihor, and Satu Mare accounting for the largest weights. Among the productive agricultural lands, the majority (excepting pastures and natural grasslands) are intended for crops, but an important share of crop production on arable lands is used as fodder for livestock sector.

Table 3. *Distribution of modern retail units (July 2010)*

County	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Alba								■	■		■			■												■	■	■																							
Arad	■		■	■	■			■	■	■	■			■									■	■	■																									■
Bihor	■	■	■	■	■				■		■					■					■	■																			■									
Bistrița-Năsăud						■		■	■	■		■	■				■																																	
Cluj	■	■	■	■	■	■	■	■	■	■	■	■	■					■	■	■																							■							
Harghita								■	■		■																						■	■	■	■											■	■	
Hunedoara	■				■			■	■	■	■			■																	■	■																		
Maramureş	■	■			■				■								■																																	
Mureş	■	■	■				■		■	■	■		■																						■	■	■		■									
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1. Metro, 2. Real, 3. Selgros, 4. Carrefour, 5. Carrefour Ex., 6.Carrefour market, 7. Auchan, 8. Kaufland, 9. Plus, 10. Billa, 11. Penny, 12. EuroMarket, 13. Oncos, 14. MinimMax, 15. Atlantic, 16. ABC, 17. Unicarm, 18. Elso, 19. Dia Market, 20. Alimrom, 21. Discount, 22. Trei G, 23. Padis, 24. Nisijar, 25. Viky, 26. Dacia, 27. Ulpia Traiana, 28. Spar, 29. Nova Tim, 30. Nevada, 31. Succes, 32. Trident, 33. Mercur, 34. Skand Impex, 35. CBA Supermarket, 36. Perfect, 37. Sicom Com, 38. Darina, 39. Alcomsib, 40. Interex, 41. Fildenis, 42. Cora, 43. Santec, 44. Piramida, 45. Barta, 46. Liana, 47. Penny XXL, 48. Szuper,49. Szilvester, 50. Lelia

(Source: http://www.revista-piata.ro/c/document_library/get_file?p_l_id=73278&folderId=73323&name=DLFE-901.pdf, last accesed on 10.08.2010)

In 2007, due to the excessive drought between 2006 and 2007, the yields were much lower compared to 2006, being about 50% of the total in the case of cereals, about 35% in the case of sunflower or about 67% for vegetables. In addition, the production of grapes and fruits accounted for about 96% and 73%, respectively, of the 2006 production. For the analysed period, decreases in production were recorded for the majority of crops with the exception of onions, tomatoes, and soy. Similar values were recorded for perennial plants, watermelons, and yellow melons, sunflower, sugar beet, and cereals.

The structure of cultivated lands is rather inappropriate to the requirements of a modern agriculture, with a share of over 63.9% of the arable land cultivated with cereals and low production per hectare, between 2,000 and 3,600 kg. The structure of field crops in a modern agriculture requires the expansion of lands cultivated with technical crops – sugar beet, oil plants, textile plants, medicinal plants, and fodder crops to support the livestock sector, whose share in agricultural lands must fluctuate around 30-35%. The high-yielding plants are also included – vegetables and grain legumes, whose current share in the structure of cultivated lands is rather low.

Due to favourable conditions of relief, climate, and vegetation, the livestock sector has an important position in the Romanian agriculture and represents one of the basic activities in rural areas. With the exception of sheep and goats, which registered increases in **livestock**, in the other livestock sectors significant decreases took place. The counties with the most important livestock productions are Timiş, Cluj, Bihor, Alba, and Mureş counties. The opposite situation appears in the case of Sălaj, Harghita, Hunedoara and Bistrița-Năsăud counties. They can be explained both by the different population size or the natural conditions unfavourable for farming and by the general standard of economic development of the respective counties.

Livestock density, expressed in livestock unit (LSU)/100 ha agricultural land, represents the indicator most specific to the livestock sector and reflects the importance of this branch as a whole (undifferentiated by species of animals). It has higher values around cities and towns as the animal products processing centres are located in cities and towns and their population represent the primary market. Both the plain areas and the mountain sectors of the Tisa basin recorded high values of livestock density, given the high percentage of the feed sector (pastures, natural grasslands, and fodder crops).

Table 4. *Density of LSU per 100 ha agricultural land*

	2002	2003	2004	2005	2006	2007
LSU	22,697,000	24,036,956	36,635,135	28,605,390	28,071,611	26,339,894
Agricultural area (ha)	5,109,392	4,995,107	5,079,390	5,026,261	4,991,879	5,025,215
Density of LSU	44.42	48.12	72.12	56.91	56.23	52.41

Source: Data processed according to the information provided by the National Institute of Statistics

Level of agricultural technology. The great share of population working in agriculture (27%) reflects a low level of development and a strong tendency towards the subsistence character of the agricultural sector. The arable land per physical tractor is around 40 ha/tractor. It can be noticed that counties such as Bihor, Timiş, Arad, Mureş, Cluj hold the largest number of tractors, therefore we can talk about an increase in the efficiency of the production process. In the period between 2002 and 2007, while the surface of arable lands increased slightly (with 4,981 ha) on account of lands covered by the removed vineyards and orchards, the number of tractors and harvesters decreased with 772 and 673 units, respectively. The explanation lies both in the replacement of the old means with more modern and efficient ones and, especially, in the general restriction of agricultural activities (as shown by the massive food imports of Romania in the last decade).

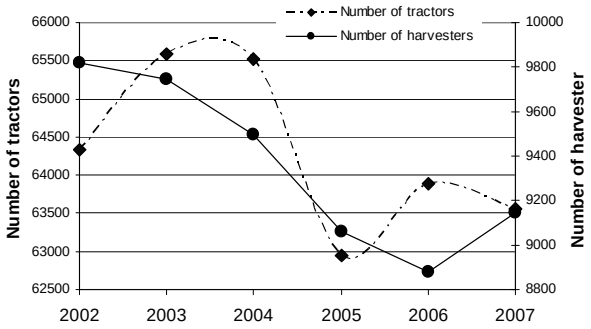

Figure 6. *Number of tractors and harvesters (2002-2007)*
(Source: National Institute of Statistics)

Organic farming can contribute decisively to the sustainable rural development, to the increase in the economic activities with an important added value and to an increased interest in rural areas. In 2007, there was a correlation between community legislation and the national one covering the objectives, principles and standards of organic farming. In addition, the production methods (vegetal and animal) and the standards of the ecological system were defined and regulated: labelling, processing, inspection, marketing and import.

Organic farming has experienced recently a dynamic evolution in Romania, both as regards the vegetal sector and the livestock sector. Thus, in 2007, the total area cultivated by organic production method was about 221,411 ha, which represent an increase of about 13 times compared to the land cultivated in 2000 and 1.54 compared to 2005.

In the counties included in the Romanian Tisa basin, this type of agriculture shows nearly the same structural and dynamic features that define the national branch. Thus, if in the case of Timiş county there is a large area to practice the type in question (16,452 ha), other counties such as Harghita are only at the beginning of such an activity. An indicator of the development level of organic farming can be the number of certified organic agricultural products. From this point of view, the situation is different, the counties of Timiş, Cluj, Bistriţa-Năsăud, and Satu Mare having no patented product until the reference date, while other counties such as Maramureş, Sălaj, Arad, Alba, Mureş, Sibiu and Hunedoara have 1-4 certified products.

Performance of the industrial sector

The analysis of the industrial sector was based on some indicators that facilitate assessments and comparisons of performance and its competitiveness.

A first indicator taken into consideration refers to the **number of companies** operating in industry. The evolution of this indicator is marked by a continuous growth, so that, in 2007, there were more than 15,000 economic agents. The most numerous companies operated in the food industry field (2,251), followed by companies in the wood-processing field (2,194). The companies in the field of metal and metal products (1,843) and clothing (1,400) were also well represented. In addition, there were companies in the field of construction, whose number doubled in the interval between 2004 and 2007.

Table 5. *Evolution of the number of enterprises in industry and construction (2004-2007)*

Economic activity	2004	2005	2006	2007
Industry	12,301	13,654	14,450	15,504
Construction	6,519	8,102	9,873	13,281
Total	**18,820**	**21,756**	**24,323**	**28,785**

Source: Data processed according to the information provided by the Ministry of Finances, National Institute of Statistics and the Trade Register

Labour productivity in industry and construction sector acts as a particularly relevant indicator in shaping the characteristics of economic competitiveness. The value of this indicator has increased 1.8 times in the analysed period, reaching an average of 44,108 euros per employee. Above-average values were registered in the counties of Sibiu, Cluj, Timiş, Mureş, Bistriţa-Năsăud and Alba.

At the level of industrial branches, the highest values for labour productivity were recorded in the extraction of hydrocarbons (160,281 euros per employee) and the lowest in the manufacture of wearing apparel (10,665 euros per employee) and manufacture of tobacco products (7,821 euros per employee).

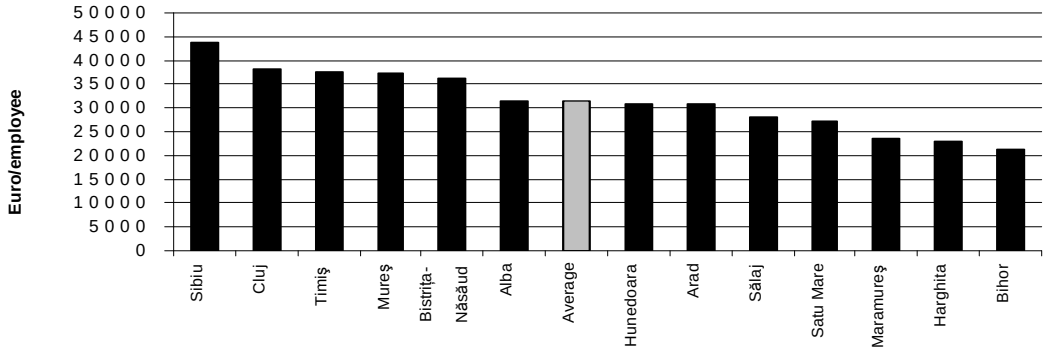

Figure 7. *Labour productivity (euro), 2007*
(Source: National Institute of Statistics)

The contribution of innovation in economic development

The dynamics and competitiveness of any economy is based, inter alia, on the capacity for innovation, whether it is the innovation of technological processes, innovation in human resource management or other subdomain of the system.

Representing leading vectors for the innovation of the economic system, either directly or indirectly, the staff engaged in research activities represent a first marker taken into consideration for the analysis. The most important finding is that between 2002 and 2007, **the number of researchers** has recorded a general decrease. The most important decrease was recorded until 2005, when the total number of researchers reached a minimum (3,888), followed by a trend towards recovery until 2007 (5,089), but without reaching the initial effectives (6,799). The spatial distribution of the research staff presents great contrasts. The presence of some universities and research centres favours a relatively high number of researchers in some counties in 2007 (e.g. Cluj, Timiş, Arad, Sibiu), while other counties are characterized by significant deficits in this sector (e.g. Maramureş, Satu Mare, Harghita), up to the total absence of this professional category (Sălaj County).

Closely related to the presence, activity and the number of researchers, **the expenditures on research activity** presents, in turn, contrasting aspects, similar to those concerning the research staff. Thus, the largest amounts allocated to research expenses were recorded in 2007, in the counties of Cluj and Timiş, while in the county of Sălaj no funds were allocated for this purpose.

Patent applications recorded a general decreasing trend, from a total of 259 in 2002 to 211 in 2007. In 2007, the largest number of such applications was recorded in the counties of Timiş and Cluj, while the counties of Satu Mare and Harghita had one such application and Sălaj had none.

Business infrastructure, approached from the industrial parks viewpoint, was represented almost in every county. Exceptions were the counties of Harghita and Maramureş, but which benefit by either a series of projects for setting up industrial parks (e.g. five projects in Harghita County), or by the existence of some business incubators (e.g. the business incubator in Baia Mare). In the other counties, the number of existent industrial parks reaches 18, at county level their number ranging between one and four. It must be noted that the largest number of industrial parks is in Cluj County (four). As a negative aspect, it is observed that sometimes, despite the existence of the infrastructure specific to such sites, they are underused, such as in the case of the Jibou Industrial Park, Sălaj County.

Index of competitiveness

The assessment of the economic competitiveness and the achievement of some comparisons between the economic competitiveness of the counties in the studied area were accomplished by incorporating the data with an increased significance for the economic status. Thus, a series of indicators were taken into account, with diagnostic valences for the economic "modernity" and "competitiveness":

a. share of population employed in agriculture;
b. share of population employed in services;
c. share of employed population (of the total population aged 15-64);
d. rate of researchers;
e. unemployment rate;
f. GDP per inhabitant;
g. productivity in the industrial sector.

Depending on the descriptive relation of direct or inverse proportion with the state of economy, these indicators were engaged under the form of a formula, as follows:

$$Q = Z \times K \quad (1), \text{ where:}$$

$$Z = \frac{b+c+d}{a+e} \quad (2) \text{ and } K = f + g \quad (3),$$

i.e.

$$Q = \frac{b+c+d}{a+e} \times (f+g) \quad (4)$$

where Q represents the index of competitiveness, with adimensional character.

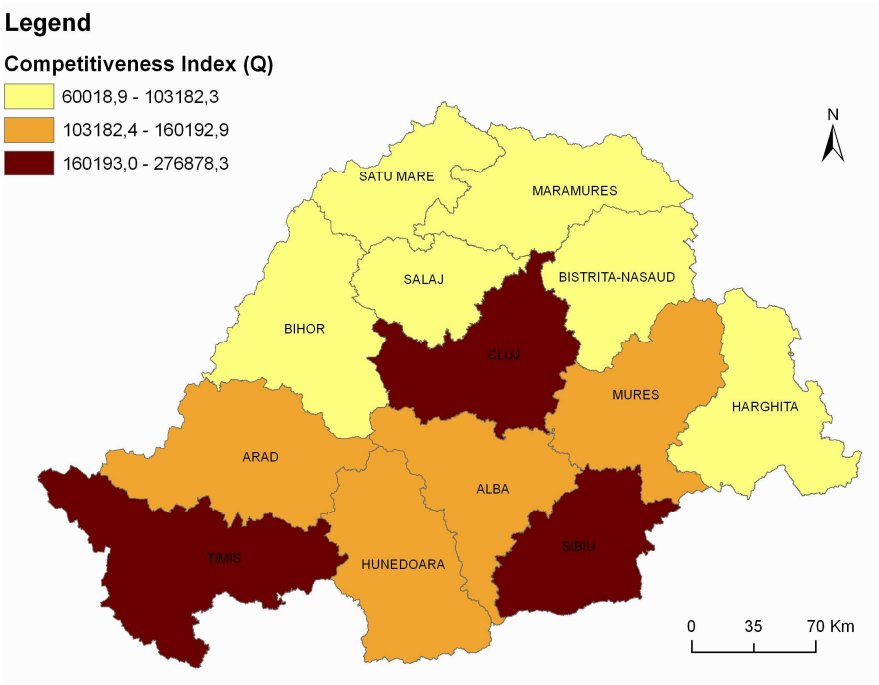

Figure 8. *Index of competitiveness (Q)*

The values of the Q indicator resulted for the analysed counties range between 60018.9 (Maramureş) and 276878.3 (Sibiu). They were grouped in three size classes using Jenks classification algorithm. Following this operation, the counties were grouped as below:

- *counties with low economic competitiveness* (Maramureş, Bihor, Sălaj, Satu Mare and Bistriţa);
- *counties with medium economic competitiveness* (Alba, Mureş, Hunedoara and Arad);
- *counties with high economic competitiveness* (Cluj, Timiş and Sibiu).

CONCLUSIONS

The analysis of the current status of the Romanian Tisa Catchment Area reflects, at medium scale, the same evolutionary trend as the national one. The assessment of the competitiveness degree of an economy, made at global and European level, factually demonstrates the existence of an average competitive status for Romania, if reported to the global level, and a low position if compared to the other European countries. The causes of this position, certified by the centralised responses of some interviewed respondents – analysis found in *The Global Competitiveness Report 2009-2010*, are represented by the fiscal provisions, instability of the political climate, access to financing sources, administrative bureaucracy of institutions, insufficiently trained professional staff, inflation, etc.

The list of indicators suggested for the economy of the region under consideration, materialised in the individualisation of an index of competitiveness, disapproves the hypothesis launched within this research, the economy of the Romanian Tisa Basin being an *economy with a low degree of competitiveness*. At county level, there are several departmental units (Cluj, Sibiu, Timiş), which, due to the polarization exerted by the county seat, manage to infuse economy, *in relative terms*, with a competitive spirit. This is largely due to the lack of temporal-spatial and structural continuity at the level of the economic sectors with a traditional vivacity (e.g. steel industry, manufacture of basic metals, manufacture of machinery).

In terms of *productivity*, there is an upward trend at regional level, unlike the values recorded at national level, aspect that betrays a high level of technology, as well as a good optimization of agricultural production. A positive evolution also characterizes *the employment rate*, during the same time interval taken into consideration, contrary to the unfavourable situation recorded at national level. In addition, an increase in the number of population employed in services was also recorded, which is encouraging especially in terms of highlighting the quality of labour resources or the development of the research-development-innovation subsector. The highest discrepancies are registered when it comes to *innovation*, the innovation capacity recording an obvious regression, with a strong local concentration.

The ***sequential*** (at the level of sub-branches or industrial units) and ***insular*** manifestation (at the territorial level) of some economic "*peaks*" ***do not compensate the general deficiencies*** found both at the level of some global indicators (e.g. GDP) and at the level of some specialised indicators (e.g. labour productivity in industry); this is the same for the index of competitiveness, whose values indicate significant differences between the analysed counties. The repercussions of the extended economic transition, from the centralized system to the market economy, upon the social subsystem is added to the overall picture as a factor inhibiting economy, especially in the case of some counties that have experienced more such phenomena (e.g. the international migration of labour force from the counties of Maramureş, Bistriţa-Năsăud and Satu Mare).

Last but not least, other factors that were not covered by the present study are directly involved in shaping some restrictive premises in relation to the economic activities, as is the case of transport infrastructure or those related to the legislative stability in the economic field.

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