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THE ROMANIAN REGIONS COMPETITIVENESS

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Abstract

Over the latest years, the issue of competitiveness has been the subject a lot of studies. Even if many of them have tended to concentrate on countries or industries, there are remarkable studies concerning the regions competitiveness (for example, 6th Periodic Report of the EU regions). In this paper we are providing an extension to the Romanian regions of the European Commission analysis focused on EU region competitiveness. Certainly, because of the lack of reliable data on the different aspects that determine overall competitiveness, any analysis can only be partial. However, as in the Commission studies, in Romania four factors emerged as being closely linked with regional differences in the competitiveness: the structure of economic activity (the division of employment between agriculture, manufacturing, construction and services), the extent of innovative activity (employees from research activity), regional accessibility (transport infrastructure) and the skills of the work force (training level).

1. DEFINING REGIONAL COMPETITIVENESS

The concept of competitiveness is relatively clear when applied to enterprises, but is more difficult to define and measure the competitiveness when applied to regions or countries. At microeconomic level, competitiveness is viewed as the "… ability to compete in markets for goods or services. This is based on a combination of price and quality. With equal quality and an established reputation, suppliers are competitive only if their prices are as low as those of rivals. A new supplier without an established reputation may need a lower price than rivals to compete. With lower quality than rivals, a firm may not be competitive even with a low price; with a reputation for superior quality, a supplier may be competitive even with a higher price than rivals" (Black J., 1997)

The concept of competitiveness is, unfortunately, more ambiguous when applied to countries or regions. A problem – in accordance with Krugman (1994) – is that the economic problem facing any modern nation is not essentially one of competing on world markets – which the United States and Japan are not competitors in the same sense that Coca-Cola competes with Pepsi. "The idea that a country's economic fortunes are largely determined by its success on world markets is a hypothesis, not a necessary truth; and as a practical, empirical matter, that hypothesis is flatly wrong", says Krugman. Another problem is that the term *competitiveness* tends to create the impression of a zero-sum game, a win/lose situation, in which countries or regions can improve their position only at the expense of others, whereas, in practice, there are mutual gains to be achieved from individual regions becoming more competitive. And there are many other questions in economic literature regarding regional or national competitiveness.

In these conditions, the challenge is to develop a concept of competitiveness that avoids these problems. The Institute for Management Development of Lausanne (authors of the World Competitiveness Yearbook) define national competitiveness as: "the ability of a country to create added value and thus increase national wealth by managing assets and processes, attractiveness and aggressiveness, globality and proximity, and by integrating these relationships into an economic and social model" (Institute of Management Development, 1996).

Likewise, in an OECD study, competitiveness is defined as the "ability to produce goods and services which meet the test of international markets, while at the same time maintaining high and sustainable levels of income" or, more generally, "the ability of companies, industries, regions, nations and supra-national regions to generate, while being exposed to international competition, relatively high income and employment levels"(Commission européenne, 1999).

At regional level, "it needs to capture the notion that, despite the fact that there are strongly competitive and uncompetitive firms in every region, there are common features within a region which affect the competitiveness of all firms located there. These features include physical and social infrastructure, the skills of the work force and the efficiency of public institutions. In an increasingly global economy, such factors can contribute strongly to business success and need to be at least of a minimum standard in order to avoid putting firms at a significant disadvantage as compared with those located elsewhere" (Commission européenne, 1999).

Economic literature point out different ways in which academics and policymakers currently think of national or regional competitiveness. However, this paper is not aiming at an overview of economic literature concerning the concept of regional competitiveness, but only at analysing the way that model developed by European Union for the European regions can be applied to Romanian regions. In these circumstances, I am using a regional competitiveness definition pointed out in the 6-th Periodic Report on Regions (Commission européenne, 1999). In the beginning, I am presenting a short economic analysis of Romanian regions. Afterwards the analysis is focusing on the regional competitiveness elements.

2. ROMANIAN REGIONAL ECONOMY

2.1. Romanian Development Regions

Compared to the other European states, Romania is a middle-sized country, with a territory of 238391 km^2, and a population of 22455.5 thousands inhabitants (at January 1st 2000).

The territorial-administrative structure of Romania includes 263 towns (of which 84 municipalities) and 2688 communes (over 13 thousand villages are grouped in these communes). The Romanian territory is organized in 41 counties (*judets*) plus Bucharest, the country capital. In accordance with the Law 151/1998 regarding regional development in Romania, there have been created 8 Development Regions, corresponding to the NUTS II statistical level. These Regions, established through voluntary co-operation of the counties (*judets*) do not enjoy legal status and are not territorial-administrative units. More than half of Romania's towns (152 from 263) have less than 20000 inhabitants and only 23 towns have a population exceeding 100000 inhabitants. Bucharest has more than 2 millions inhabitants. Urban population represents 54.8% of total population.

Table 1: General Information on Romania and the Development Regions, 2000

Region	Judets (counties)	Area, km^2	Population (thou)
ROMANIA	42 (Including Bucharest)	238,391	22,456
1. North-East	Bacău, Botoşani, Iaşi, Neamţ, Suceava, Vaslui,	36,850	3,810
2. South-East	Brăila, Buzău, Constanța, Galați, Tulcea, Vrancea	35,762	2,940
3. South	Argeş, Călăraşi, Dâmbovița, Giurgiu, Ialomița, Prahova, Teleorman	34,453	3,480
4. South-West	Dolj, Gorj, Mehedinți, Olt, Vâlcea	29,212	2,410
5. West	Arad, Caraş-Severin, Hunedoara, Timiş	32,034	2,040
6. North-West	Bihor, Bistrița-Năsăud, Cluj, Maramureş, Satu-Mare, Sălaj	34,159	2,850
7. Centre	Alba, Braşov, Covasna, Harghita, Mureş, Sibiu	34,100	2,645
8. Bucuresti-Ilfov	Bucureşti, Ilfov	1,821	2,281

Source: National Commission for Statistics, 1999, and Institute for Economic Forecast, 2000.

2.2. Romanian Regional Disparities

Since the beginning of the transition period in 1990, Romania's economic situation has declined significantly, and 1999 was the third consecutive year of real GDP decline,

which fell by 3.2% compared to 1998. This evolution led to a sharpening of the disparities against EU-15.

DEVELOPMENT REGIONS

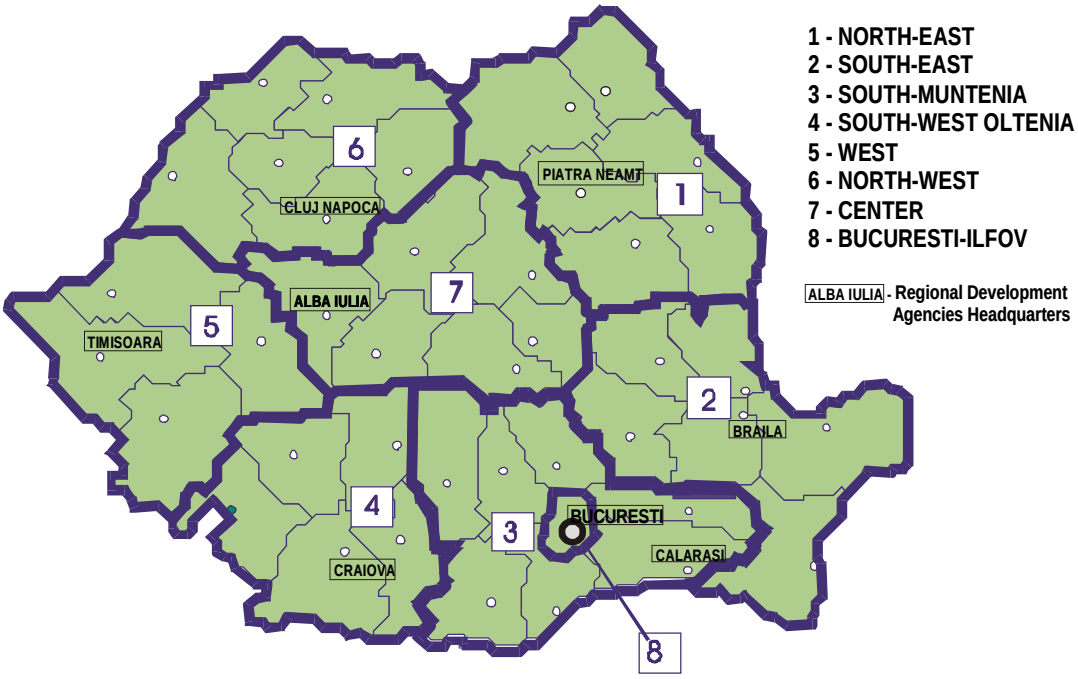

Table 2: Romania - Main economic indicators

Indicators (percent)	1996	1997	1998	1999	2000
Real GDP growth rate	3.9	-6.1	-5.4	-3.2	0.9[1)]
Inflation rate					
- annual average	38.8	154.8	59.1	45.8	
- December-on-December	56.9	151.4	40.6	54.9	44.0[2)]
Unemployment rate	6.6	8.9	10.3	11.5	11.8[3)]

Source: National Commission for Statistics, 1998, *Statistical Year Book*, and National Commission for Statistics, 2000, *Monthly Statistical Bulletin*, 1-4.
Notes: [1)] 2000, First Quarterly; [2)] May, 2000 on May 1999; [3)] At the end of May 2000.

The Romanian average GDP per capita at purchase power parity was 27% of the EU-15 average. There are significant disparities between the Development Regions. The most

developed one - the Bucharest-Ilfov Region - enjoyed a 38% of the EU-15 GDP per capita average, while the poorest Region, the North-East, had an estimated 21% of this average.

Table 3: GDP/capita in Romanian Development Region, 1999

Region	Romanian average GDP per capita = 100%	EU-15 average GDP per capita = 100%
ROMANIA	100	27
1. North-East	76	21
2. South-East	104	28
3. South	93	25
4. South-West	98	26
5. West	115	31
6. North-West	90	24
7. Centre	103	28
8. Bucuresti-Ilfov	142	38

Source: Calculations based on National Commission for Statistics, 1998, *Statistical Year Book*, National Commission for Statistics, 2000, *Monthly Statistical Bulletin*, 2/feb., and Eurostat, 1999, l'Office Statistique des Communautés européennes à Luxembourg: *L'élargissement de l'UE Données clés sur les pays candidats*, Memo 10/99, 7 décembre.

In Romania, regional disparities have historical, geographical, cultural and economic roots. These disparities, especially those economic, have expanded during transition because, on the one hand, of substantial economic fall (at the end of 1999 GDP reached only 75% of its 1989 level), and on the other hand of the firms' behaviour in an economic environment with very high and long term inflation. In the same economic environment, resources will be orientated to regions that offer the opportunity of a rapid profit growth, and a rapid investment recapture (see, for details, Jula & Jula, 1998).

Moreover, the transition reveals the economic weakness of poor developed areas: the strong dependence on a single industry, poor town planning and low localities attractiveness, insufficient utilities infrastructure development a.s.o. The regions with dominant rural areas are the poorest. They are strong dependent on agriculture and lack

a young and adult population (as in past decades they migrated to urban areas). In accordance with Myrdal regional development theory (Myrdal, 1983), a development of some centre (poles) produces a dual impact on surrounding areas. On the one hand, there is a positive *spread effect* – stimulation of development due to the demand of raw materials, to the new technologies, innovation diffusion, etc. On the other hand, a *backwash effects* – the withdrawal from underdeveloped region of skilled labour, capital and goods: the centre lure the qualitative elements of development, by filtering the inflows and expel towards purlieus the cumbersome crumbs of their growth. Unfortunately, the Romanian experience concerning the development role that urban areas play within the locality network has recorded only the *backwash effect*: most of Romanian cities have exhausted rather than generated energy and development in the surrounding rural areas. This has deepened the urban-rural gap.

Significant disparities exist, however, within each Development Region. For example in the Centre Development Region, Brasov and Sibiu counties are significantly more urbanised and wealthier than the other four counties in the Region.

3. THE FACTORS OF REGIONAL COMPETITIVENESS

A recent study done for the European Commission (Pinelli, 1998) aimed at reducing the competitiveness issue to its core elements through building a simple model concerning the relationship between the regional GDP per capita and the main elements that contribute to the specific indicators evolution. The approach followed was, firstly to identify the main elements listed in the economic literature that are supposed to explain variations in GDP per head between regions; secondly the making of a simple, but statistically robust and observable indicator to represent it and, thirdly, to correlate variations between these indicators across regions with variations in GDP per head as well as GDP per person employed.

The conclusion of the study was that four factors emerged as being closely linked with regional differences in the GDP measures:

- *the structure of economic activity*, which was simply represented as the distribution of employment between agriculture, manufacturing, construction, market services

and non-market services; the regions with the highest levels of GDP per head tending to have a relatively high concentration of employment in market services and/or manufacturing;

- *the extent of innovative activity*, which was measured by the number of patent applications; the best performing regions tending to be the source of more applications than others;
- *regional accessibility*, which was measured by a new index of peripherality, which implicitly includes the effects of variations in transport infrastructure; the regions where GDP per head is above average tending to have better accessibility;
- *the skills of the work force*, which were measured by the relative numbers of people aged 25 to 59 with high (university level or equivalent), medium (upper secondary level qualifications) and low (basic schooling only) levels of education; the best performing regions tending to have an above average proportion of relatively highly qualified workers.

Econometrically, it is proved, using a simple linear regression equation, that these four indicators explain almost two-thirds of the variation in GDP per capita between regions in the European Union. It is considered that this result, however, needs to be interpreted with a good deal of caution, because the correlation is only an average one and there are many regions which diverge from the average (the model has not a reasonably high value for R-squared).

For Romania, the correlation between the regional GDP per capita and the above estimates of mentioned factors in the study of the European Commission is difficult to make, mostly due to the difficulties related to the Romanian statistical system. Under these circumstances, maintaining the above mentioned study approach, the measurement of the innovation activity and of the accessibility degree is made using other indicators. Thus, lacking the data concerning the regional patents demand, they used data related to the research activity. The used indicator is the employed population in research and development activities, compared to the whole amount of employed population. Concerning the accessibility degree it is difficult to make a global indicator to reflect the heavy infrastructure and the market size as it is recommended in the

European Commission study. Under these circumstances the accessibility is estimated starting from the transportation infrastructure.

Table 4: Correlation coefficients between GDP per capita – (regional values) and competitiveness elements

Competitiveness elements		Correlation coefficients
Employment in	Agriculture and sylviculture	-0.735
	Industry and construction	0.680
	Services	0.492
Education level	Higher education	0.755
	Gymnasium and secondary education	0.725
	Primary education	-0.825
Employment in research-development activities		0.478
Railway transport infrastructure		0.391
Road transport infrastructure		0.089

The data presented in the Table 4 show that the Romanian competitiveness elements keep the main trends recorded for the European Union. Under the caution of the indicators significance used in calculations, we can assert that:

– The regional GDP per capita is positively and strongly correlated with the degree of employed population in manufacturing and construction (Pearson linear correlation coefficient is +0.54). This value is, however, strongly influenced by the special situation of the region that includes the country capital. Region VIII ((Bucharest + Ilfov) is the most developed area in the country and has the best development factors. If we let aside this region from our calculations, then the Pearson linear correlation coefficient between GDP per capita and the degree of employment in the manufacturing and construction is by +0.28, that indicates a regional distribution of industry without too many disparities in the rest of the country.

– The regional GDP per capita is positively and strongly correlated with the degree of population employment in services (+0.93). This value is influenced only in a small degree by the special situation of the region that includes the capital.

– The regions with a population employment in agriculture are less economically developed: the GDP per capita is negatively and strongly correlated with the degree of population employment in agricultural activities (-0.93). Like the degree of employment in services, this figure is influenced only in a small degree by the special situation of the region that includes the capital.

– On one hand, the regions that have a GDP per capita over the national average are a focus for a highly trained work force (+0.92), and on the other hand, the correlation between the regional development level and the extend of the elementary skilled persons in the aged population is strongly negative (-0.96). The dimension of the sample does not significantly influence this conclusion. Further to this context, there are not significant disparities in the regional distribution of population with elementary and college diplomas (the estimate ratio between standard deviation and series average does not rise over 8-9%). But there are significant disparities in the regional distribution of highly trained population.

– In Romania there is a positive correlation between the regional distribution of the innovation capacity and the GDP per capita (+0.82). The level of this indicator is strongly influenced by the relatively strong level of the capital development (compared to the rest of the territory). If we let aside from calculation the region that includes the capital, then the correlation coefficient between the regional distribution of the innovation capacity and GDP per capita distribution is only by +0.27. This proves that the capital is a strong focus for the national innovation capacity.

– Concerning the impact of accessibility degree over regional development we notice both the positive relatively strong correlation between the railway network distribution and the GDP per capita distribution and the positive connection between the development level and the existing transportation territorial infrastructure elements.

Likewise, the reciprocal connections between the analysed factors match as a meaning and to a great extend as intensity with the values calculated for European Union regions.

Table 5: Correlation coefficients between regional competitiveness elements, 1997

1997	GDP	EInd	EAg	EServ	PHg	PSec	PPr	ERs	DRw	DRo
GDP	1	0.54	-0.93	0.93	0.92	0.96	-0.96	0.82	0.85	0.59
EInd	0.54	1	-0.71	0.43	0.49	0.64	-0.57	0.53	0.58	0.44
EAg	-0.93	-0.71	1	-0.94	-0.95	-0.93	0.96	-0.91	-0.94	-0.71
EServ	0.93	0.43	-0.94	1	0.99	0.89	-0.96	0.92	0.93	0.70
PHg	0.92	0.49	-0.95	0.99	1	0.91	-0.98	0.96	0.97	0.75
PSec	0.96	0.64	-0.93	0.89	0.91	1	-0.97	0.83	0.87	0.57
PPr	-0.96	-0.57	0.96	-0.96	-0.98	-0.97	1	-0.92	-0.95	-0.68
ERs	0.82	0.53	-0.91	0.92	0.96	0.83	-0.92	1	0.99	0.89
DRw	0.85	0.58	-0.94	0.93	0.97	0.87	-0.95	0.99	1	0.86
DRo	0.59	0.44	-0.71	0.70	0.75	0.57	-0.68	0.89	0.86	1

The symbols significations are the following:

Symbol	Signification
GDP	Gross Domestic Product per capita (1997) and by Development Regions, calculated on the basis of the purchasing power parity
EAg	Employment in mining and quarrying, agriculture, sylviculture, forestry and hunting, by Development Regions
EInd	Employment in manufacturing, electric and thermal energy, gas and water, construction, by Development Regions
EServ	Employment in market services and non-market services, by Development Regions
PHg	Higher education (university graduates) persons as share in population aged 20 – 59 years, by Development Regions
PSec	Gymnasium and secondary education persons as share in population aged 20 – 59 years, by Development Regions
PPr	Primary education persons as share in population aged 20 – 59 years, by

Symbol	Signification
	Development Regions
ERs	Employment in research-development activities per 10,000 employed persons, by Development Regions
DRw	Density of railway under operation (normal gauge lines) per 100 km^2 of territory, by Development Regions
DRo	Density of public roads per 100 km^2 of territory, by Development Regions

For Romania, the strong correlation between the describing competitiveness elements make impossible the building of a global econometric model, similar to the already analysed one far the European Union regions. Econometrically speaking, this is due to the strong connections between the describing variables that cause the multicollinearity phenomenon. The effect of multicollinearity among explanatory variables is to increase the standard errors of the regression coefficients and reduce the value of t-statistics, thus making coefficients less significant (and possibly even insignificant). Furthermore, the covariance between the regression coefficients of a pair of highly correlated variables will be very high, thus making it difficult to interpret individual coefficients (Ramanathan, 1992 and Pindyck and Rubinfeld, 1998): so, if two explanatory variables are strongly correlated, their variance takes place simultaneously and it is difficult to separate the individual effect on endogenous variable.

In spite of all these, the analysed data for Romania, both at county level and at Development Region level demonstrates that the model built for the developed economies from the European Union can be tailored for the regional analysis in the transition economies, as well. In other words, even in weak structured economies, as the Romanian economy, the GDP per capita is positively, relatively strongly correlated with the degree of employment in manufacturing, in construction and in services, and the region with a population mostly agrarian are less developed from an economic point of view.

Likewise, the regions that have a GDP per capita over the national average are a focus for the highly skilled work force while the correlation between the development level and the share of elementary trained employable persons is strongly negative. One can

also state that in Romania there is a positive correlation between the regional distribution of innovation capacity and the GDP per capita distribution. Concerning the accessibility degree impact on regional development, we also notice that there is a positive correlation between the road and railway infrastructure distribution and the regional GDP per capita distribution.

At the same time, the reciprocal connections between the development elements are in accordance as a meaning and to a great extent as intensity, to the values calculated for European Union regions. Namely, in Romania, the regions where the population share employed in the manufacturing, construction and services is high, these regions attract a highly skilled work force and focus for the research activities. At the same time, the mostly agrarian regions are strongly and positively correlated with an elementary skilled population and have less heavy infrastructure elements.

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