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REGIONAL INEQUALITIES OF INTELLECTUAL RESOURCES IN THE WESTERN BALKANS

GYULA HORVÁTH

Introduction

The future development of the Western Balkans will be greatly determined by the mental condition of the population and its research and development potential. The Balkan countries still occupy the very last positions in the European competitiveness ranking. As regards the two factors of global competitiveness demonstrating intellectual resources (higher education, and training and innovations) a more significant variance can be detected in the position of countries. Four countries are in the middle third of the international ranking of the quality of intellectual resources, Albania and Bosnia-Herzegovina are in the middle/end of the last third of the 139 examined states (Table 1). The problems arising from the scarcity and insufficient quality of human resources and R&D capacities necessary to maintain long-term economic growth are aggravated by the uneven spatial distribution of these factors within the respective countries.

Table 1: The position of Western Balkan countries in the global competitiveness index ranking of countries

	Global competitiveness index		Higher education and training		Innovation		Quality of scientific research institutions	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Albania	88	3.94	84	3.86	121	2.57	128	2.47
Bosnia-Herzegovina	102	3.70	88	3.80	120	2.59	104	2.97
Croatia	77	4.04	76	3.97	70	3.08	51	4.01
Macedonia	79	4.02	72	4.04	97	2.88	71	3.52
Montenegro	49	4.36	52	4.51	45	3.48	36	4.39
Serbia	96	3.84	74	4.01	88	2.93	56	3.89

Source: Author's own calculation based on The Global Competitiveness Report, 2010–2011.

In order to create a new economic structure necessary for the amelioration of the currently rather low income producing capacities, highly qualified professionals, industrial and service companies producing high added values and institutions capable of creating innovations are required in the respective regions of the countries. A small proportion of the working age population attended univer-

sity or college degrees in the Western Balkan countries (6 per cent in Albania, 15 per cent in Croatia and 14 per cent in Serbia). The number of regions with large populations where the share of highly qualified individuals does not even attain 4 per cent is considerable. During the past two decades the number of students enrolled in higher education institutions in these countries has not increased at the same speed as in Central and Eastern Europe. The number of students per 100,000 inhabitants (2,571 in 2008) is two-thirds of the EU average.

Among the laws related to the functioning of the democratic political system and the market economy in the Balkan countries, we can also find legal documents regulating the new norms and institutions of higher education, training and research and development. However, the normative dispositions focusing on the moderation of regional inequalities of these two main domains of activities are absent from them.

Historical Background of Regional Inequalities

Owing to the specific spatial development of countries of the Balkans, the location of intellectual activities shows significant disparities. As a characteristic feature of belated development, these countries are lagging behind Western and Central Europe in terms of university training and research and development activities. During the last decades of the 19th century, European universities showed a rapid development in contrast with Balkan countries. This development lag has century-long historical roots. On the territory of the former Austro-Hungarian Monarchy, the development of higher education was closely intertwined with the spread of the Counter-Reformation. The first higher education institution was established in Ljubljana at the end of the 16th century, and later on, in the 18th century, the Jesuit order was placed under state control. The system of Jesuit education influenced higher education in Zagreb in a positive way also. In Zagreb, the first college was founded at the end of the 17th century, and two centuries later, in 1874, the University of Zagreb opened its doors.

In Belgrade, higher education started to develop later. The process of unification of higher education institutions located in different Serbian territories started at the end of the 19th century, Belgrade became the centre of Serbian higher education; its university was founded in 1892. The establishment of the provincial faculties of the University of Belgrade was seen as the key to the development of higher education by the Kingdom after World War I. The Serbian educational government established a faculty of philosophy in Skopje in 1921, a faculty of law in Subotica in 1920 and a faculty of agrarian sciences in Sarajevo in 1941 (Uvalić, 1952). Independent new universities were not established between the two world wars in the Kingdom of Yugoslavia.

The Yugoslavian government took serious measures to reconstruct the higher education system after World War II. The ravages of the war were severe. Fourteen per cent of the higher education institutions were destroyed and 36 per cent of them were damaged. The National Library of Serbia in Belgrade was completely destroyed. The majority of university lecturers were killed during the war.

In the final years of the 1940s, immediately after the reconstruction, new universities were founded in Sarajevo, the capital of Bosnia-Herzegovina, in Skopje, the capital of Macedonia, in the chief town of Vojvodina, in Novi Sad and Niš. The new universities established faculties of agrarian studies, humanities, forestry, technical sciences, medical sciences and law. Substantial modifications were effected in the disciplinary profiles of the universities of Belgrade, Zagreb and Ljubjana, and 10–12 new faculties were set up. This led to a profound evolution of the quantitative indices of higher education. While the number of students was 17,247 and the number of lecturers was 365 in the academic year 1938/1939, student numbers rose to 52,480 and the number of lecturers reached 1,018 by the academic year 1949/1950. Before the war, 18 university faculties were operating in the country. Albania did not have any higher education institution with university ranking before World War II.

The period between 1951 and 1990 saw the most intense development of universities in the newly established federative state of Yugoslavia. During this era, 22 universities were founded mostly in less developed member republics. Regional university centres in Croatia and Serbia were also established in this period (Table 2).

Table 2: Periods of university foundation in countries of the Balkans

Periods	Number of universities	City
Before 1945	3	Ljubljana, Zagreb, Belgrade
1945–1950	2	Skopje, Sarajevo
1951–1970	8	*Serbia:* Niš, Priština, Belgrade (University of Agrarian Sciences, University of Economics), Novi Sad; *Albania:* Tiranë (University of Tiranë, Technical University), Shkodra
1971–1990	14	*Albania:* Tiranë (University of Agrarian Sciences, University of Physical Education, University of Arts, University of National Defence); *Bosnia-Herzegovina*: Banja Luka, Mostar, Tuzla; *Croatia*: Osijek, Rijeka, Split, Maribor, Belgrade (University of Arts); *Macedonia*: Bitola; *Montenegro*: Podgorica
After 1991	14	*Albania*: Elbasan, Gjirokastra, Korca, Vlora (University of Sciences, University of National Defence), Berat, Fier, Durrës; *Bosnia-Herzegovina*: Bihač, Zenica; *Croatia*: Zadar; *Macedonia*: Štip, Tetovo (State University, South East European University)

Source: Author's own construction based on university homepages.

Several state universities were founded in Albania after the change of regime. Former colleges were amalgamated into six new universities. A new university was founded in Zadar, Croatia, and a large number of private universities and colleges were established in several republics.

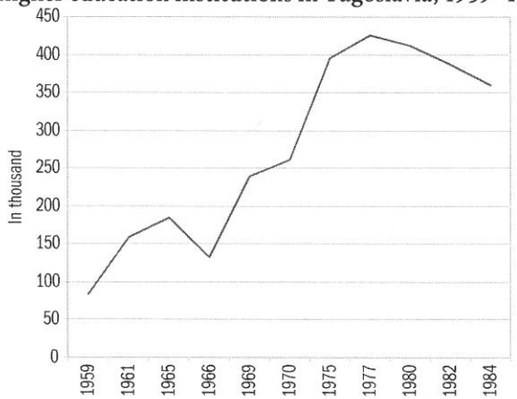
The foundations of the first comprehensive reform of the Yugoslavian system of higher education were laid down during the final years of the 1950s. The package of recommendations of federal legislative and executive organs and the Law on Higher Education of 1960 modified the operational order of higher education, raised the number of students in higher education, and established new faculties and educational branches. The aim of this extensive development was to raise the standard of qualification of Yugoslavian society and to speed up social mobility. The country's intellectual potential was well below the European average. As a consequence of the high rate of agricultural employment (61 per cent), 25 per cent of the Yugoslavian population was illiterate in the beginning of the 1950s.

By the mid-1950s, the number of students pursuing their studies in 93 faculties reached 98,630. The number of faculties increased further as a result of the reform, the academic year 1959/1960 saw the establishment of 16 new faculties. Besides the rapid development of university training, there was a significant increase in the number of colleges. Substantial changes occurred in the spatial concentration of higher education also. In previous times, only the capital cities of the republics and a few large towns (ten settlements) had university faculties and 21 settlements were endowed with colleges. As a result of the reforms, the number of university towns increased to 14, the number of college towns reached 59 (Giles, 1979). The strategic direction of the development of higher education was technical training. In the beginning of the 1960s, technical higher education experienced dynamic growth in Niš, Kragujevac and Tuzla (Krneta, 1966). Student numbers in higher education peaked in 1977, the number of students enrolled in universities and colleges was five times higher than at the introduction of the reform (Figure 1).

In the meantime, the forced growth of student numbers produced considerable negative effects. The process of expansion was spontaneous and did not follow any pre-designed course. Several towns strived to obtain higher education institutions. The rapid pace of industrialisation encouraged the increase of student numbers. The shortage of professors and the uneven quality of training are among the primary negative effects of non-synchronised developments. The structural transformation of higher education began in the mid-1960s. Low quality institutions disappeared in a short while. By the 1970s, 27 colleges had been closed in more developed republics (Slovenia, Croatia and Serbia). The

number of universities reached 18 in the final years of the 1970s. However, this quantitative growth was not accompanied by a qualitative improvement of basic university functions (training of professionals and research). Instead, the integrity and multidisciplinary approach of universities weakened. The concept of university organisation based on the primacy of faculties is strongly present in higher education systems of Balkan countries.

Figure 1: Evolution of the number of students in higher education institutions in Yugoslavia, 1959–1984



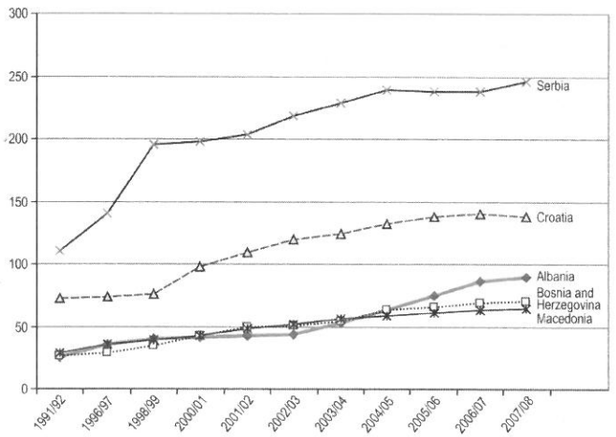
Source: Statistical yearbooks of Yugoslavia. Author's calculation based on data from different years.

Spatial structure of higher education at the beginning of the 21st century

The Balkan countries' system of higher education underwent a significant quantitative development simultaneously with the building of the market economy (Figure 2). Student numbers increased, university structures were transformed, leading to a growing number of faculties. New disciplines appeared in higher education institutions. Despite a significant quantitative development still lagging behind the Eastern European average, the quality and competitiveness of higher education are by far insufficient. The low enrolment ratio, the large spatial concentration, the non-uniform system of higher education, the unfavourable disciplinary structure, the weak infrastructure and the lack of financial resources are among the most crucial problems in the higher education system of the Balkans (Table 2). The evolution of student numbers in the Balkan states was much more modest than in Eastern European countries. Even though the Albanian system of higher education experienced the largest growth (200 per cent), this country has the lowest proportion of students enrolled in higher edu-

cation among the college-age population. The training structure of universities and colleges shows large disparities, the number of students involved in technical and natural scientific training is low. Serbia is the only exception, where the role of technical training is almost equivalent to the EU average.

Figure 2: Development of number of students in the Western Balkan countries, 1991–2008, '000



Source: Author's elaboration on national statistical data.

The spatial structure of higher education is characterised by the outstanding dominance of capitals. More than 50 per cent of the students are concentrated in the largest cities, two-thirds in Albania and Macedonia. In Montenegro, a country with a small population, only the capital has a higher education institution (although the University of Podgorica established faculties in several cities). Such a great concentration in the development of human resources is seldom found in European countries. The concentration of higher education is twice or three times as high as the share of the capital in the country's population. (Zagreb concentrates 17.4 per cent of the population of Croatia, Belgrade concentrates 21.5 per cent of the population of Serbia and 18.0 per cent of Albania's population lives in Tiranë.)

The largest and strongest university centre of the Western Balkans is Belgrade, which established its strong role in higher education during the Yugoslavian era. The University of Belgrade, composed of 31 faculties, had 90 thousand students and 7 thousand lecturers in 2007. Several dozens of public and private colleges have over 33 thousand students. Zagreb similarly is a huge centre of higher education in the area with 77 thousand students. The second largest group includes Tiranë (54 thousand students), Sarajevo (50 thousand students), Skop-

je (40 thousand), Novi Sad (35 thousand), Priština (31 thousand) and Niš (27 thousand). The 10–15 faculties of the large universities in these cities offer a wide range of training programmes (Figure 3). There are nine higher education institutions with 10–20 thousand students (Kragujevac in Serbia, Rijeka, Split, Osijek in Croatia, Tuzla, Banja Luka, Mostar in Bosnia-Herzegovina, Podgorica in Montenegro and Bitola in Macedonia).

Table 3: Some important indices of higher education in countries of the Balkans, 2007

Country	Student number, thousand			Distribution of student numbers between the main disciplines, per cent				Weight of the capital, per cent	Percentage of students in college-age population, per cent
	1999	2007	Change, per cent	Arts	Social sciences	Natural sciences	Technical sciences		
Albania	38.5	80.7	209	5	29	2	4	65.8	19
Bosnia-Herzegovina	...	68.3	...	16	37	4	10	48.8	34
Croatia	95.9	140.0	146	8	38	7	12	52.7	47
Montenegro	...	...	...	...	...	...	...	100.0	...
Macedonia	...	...	...	11	32	7	11	67.0	36
Serbia	194.2	238.7	123	10	39	8	21	51.5	48

Source: Author's own estimations based on UNESCO Institute for Statistics, and national statistical data sources.

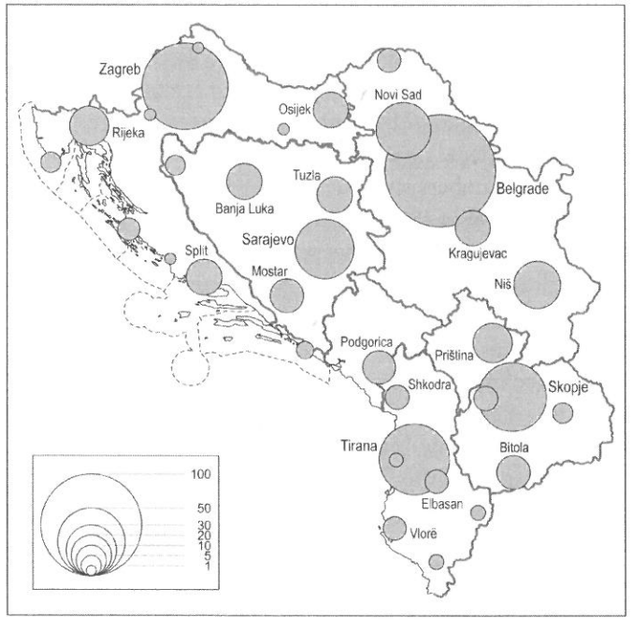
Over ten years, the number of university students tripled in Albania. The number of students enrolled in Albanian universities was 28,300 in 1994, rising to 90,200 by 2008. Universities established after 1991 account for over fifty per cent of the growth. The increase of student numbers in Albanian higher education played an important role in the establishment of private institutions. The vast majority of Western Balkan private universities, namely 32, are located in Albania (Tiranë). The centre of gravity of state universities is in Tiranë. The capital concentrates up to 57.3 per cent of the institutions. Albanian private universities are almost exclusively found in the capital, thus Tiranë concentrates 67 per cent of the total number of higher education institutions. State universities outside the capital reveal a relatively even spatial distribution. Universities were established in the country's dominant regional centres. Student numbers of the universities of Shkodra, Elbasan and Vlora are between 6 and 7 thousand. Sur-

prisingly, Albania's second largest city, Durrës, with a population of 180 thousand, has the smallest state university (2,328 students in 2007).

After the change of régime, Croatian higher education developed at a more moderate pace. The growth halted in 2007, to be followed by a slow decline. The system of higher education is built up of seven universities, 13 vocational colleges and 25 private colleges. The average student number of universities is 20 thousand, the size of state and private colleges is much more modest, they operate with an average student number of 1,500–2,000. The spatial structure of higher education reveals two specificities. One is the large spatial concentration of training, with the weight of Zagreb exceeding 50 per cent. The second distinctive feature is that several factors of state higher education show a relatively even spatial distribution. Multi-faculty universities with 15–20,000 students can be found in all the country's large regions. Over 80 per cent of the vocational colleges are located in county towns, however, a large proportion, two-thirds of the private colleges were established in the capital. The distribution of student numbers of higher education institutions between the country's NUTS2 regions is as follows: Northwestern Croatia (Zagreb, Zaprešić, Varaždin, Krapina, Čakovec): 54 per cent, Adriatic Croatia (Rijeka, Zadar, Šibenik, Split, Pula, Dubrovnik, Gospić, Knin, Višnjan): 33 per cent, and the Pannonian region (Osijek, Vukovar, Bjelovar, Virovitica, Slavonski Brod, Karlovac):13 per cent.

Higher education in Serbia is characterised by the lowest development dynamics in the Western Balkans. The rate of growth between 1990 and 2007 was 23 per cent with the number of students reaching 200 thousand in 2000. The evolution of student numbers took place in the traditional higher education structure, neither the institution foundation fever nor the presence of the private sector produced considerable effects in Serbia. The 177 faculties of six large state universities and 94 colleges of economy, technology, arts and pedagogy provide the basis of the present higher education training. The majority of these institutions are spread across medium sized towns. The six universities are located in large cities. Higher education is concentrated in the capital city in Serbia as well, 51.5 per cent of the students study in Belgrade. The concentration of universities in Novi Sad is quite significant even by European standards; the university with 36 thousand students and nine local faculties has outsourced faculties in Subotica, Sombor and Zrenjanin as well. The third largest university centre, Niš, is one of the strongholds of Serbian technical training, seven out of the university's 13 faculties are technical and technological. An important asset of the University of Kragujevac – apart from its strong technical profile – is that it has established faculties in five towns in Central Serbia.

Figure 3: Spatial location of higher education institutions of Western Balkan countries, 2007, number of students, thousand



Source: Author's own work based on National statistical archives.

The University of Priština had a prominent position among Serbia's large universities and it is no longer a part of the country's system of higher education. Based on a decree of the Alliance of Yugoslavian Communists, Kosovo's first institution of higher education was founded in 1969. The university, displayed as a symbol of Tito's minority policy, organised training programmes in Serbian and Albanian languages in thirteen university and seven college faculties. As a manifestation of the rising nationalism in the first years of the 1990s, Albanian-language training was suspended at the university. Higher education in Albanian was pursued in training centres located in different areas of the republic populated by Albanians. The situation changed again in 1999. Serbian higher education moved outside the university's walls, and was pursued in areas populated by the Serbs (Kruševac, Kosovska and Mitrovica). In 2009, the number of students pursuing their studies in twelve university faculties in Priština and three college faculties in the towns of Pejë, Ferizaj and Mitrovicë was 29 thousand. Six South Serbian settlements (Kosovska Mitrovica, Zvečan, Zubin Potok, Leposavić, Gračanica, Ranilug and Kusac) concentrate the 10,000 students of the 11 faculties of the Serbian-language university. The number of lecturers at

the Albanian university is 1,600, with 750 at the Serbian institution (Baćević, 2010; Bračić and Dail, 2010). Studies focussing on the development of higher education in Kosovo stress the importance of a higher number and a more even spatial distribution of universities (Bache and Taylor, 2003; Baliqi, 2010).

The number of students enrolled in higher education institutions of Bosnia-Herzegovina (in 62 faculties of five universities, three colleges of arts and theology and 23 private colleges) was 68,317 in the academic year 2007/2008. The evolution of student numbers surpassed somewhat the Balkan average; there was a 55 per cent growth in the first decade of the twenty-first century. The professional structure of higher education shows the worst picture in the region with the highest rates of students of humanities (16 per cent) and social sciences (37 per cent). The number of students pursuing their studies in faculties of political sciences and philosophy exceeds by approximately 20 per cent those studying in technical faculties.

The universities of Sarajevo, Tuzla, Zenica, Bihać and the Džemal Bijedić University separated from the University of Mostar are located in the Bosnian and Herzegovinan region of the Federation. The University of Banja Luka and the former University of Mostar operate on the territory of the Serb Republic of Bosnia. The spatial concentration of higher education characterises this country as well with 48.8 per cent of the students (33,300) enrolled in Sarajevo's institutions.

Quantitative data characterising the higher education network of the Republic of Macedonia largely resembles those of most countries of the Balkans. There was a 55 per cent rise in student numbers between 2000 and 2008, and the number of students totalled 64,254 in the academic year 2008/2009. During the previous academic year, 41,000 students were enrolled in 21 faculties of the University of Skopje. Two-thirds of Macedonian higher education students are concentrated in the capital. The country's second largest higher education institution, the University of Bitola, has eight faculties and 11 thousand students. The most recently established state university, Goce Delčev University, operating in 11 settlements, was founded in 2007. The university's seat is located in Štip, the regional centre of Eastern Macedonia.

The fourth-largest state university of Macedonia was founded in Tetovo, the largest city of Western Macedonia with an Albanian majority. Training programmes in Albanian, Macedonian and English languages are organised in ten faculties for 4 thousand students. An institution maintained by private funds, the South East European University with six faculties providing education in Albanian was established in Tetovo in 2000. The university enrolled 6 thousand students in 2009.

The higher education system of Montenegro is monocentric. The State University of Montenegro hosting 15 faculties and 18 thousand students and the Mediterranean Private University with 2,200 students are located in the country's capital city, Podgorica. Outside the capital, the state university has faculties in eight towns (Nikšič, Cetinje, Kotor, Budva, Bijelo Poljem Berane, Herceg Novi, Igalo and Bar). All are characterised by a low level of research activities.

R&D under changing conditions

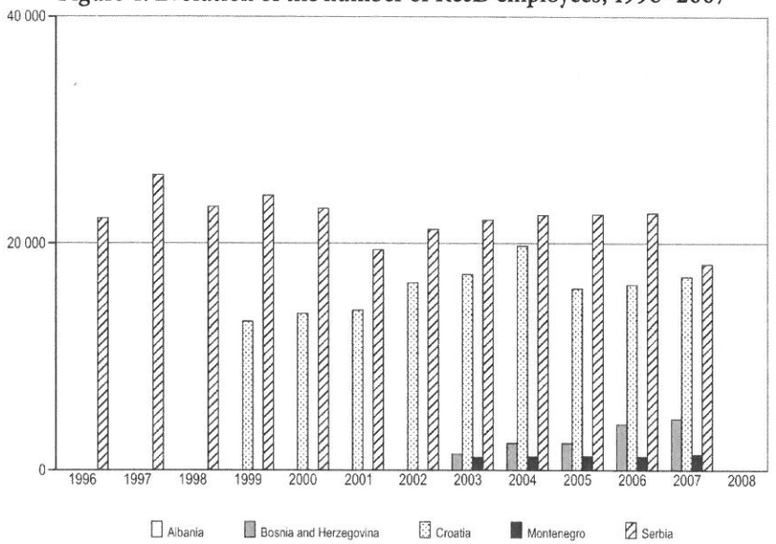
The dissolution of Yugoslavia, the collapse of the system of self-management and the transition to market economy transformed the research and technological map of the Western Balkans. The weakening industrial and production linkages between former parts of the country had a negative effect on research and development capacities. The Yugoslav system of innovation showed a higher level of development than in Eastern European communist countries, the developed Yugoslav industry accustomed to applying modern Western technologies operated a large number of research units as well. In Yugoslav member republics with developed industries, 2–3 per cent of the GDP was allocated to R&D purposes. The institutional system of Yugoslav science was decentralised, scientific academies of member republics established their own institutional networks, and sectoral research institutions were subordinated to the control of the republic. The federal government was responsible for the harmonisation of R&D.

Following the dissolution of Yugoslavia, the former bases of the system of research and development collapsed as well. In contrast with higher education, the R&D sector lost most of its positions in the Balkan countries after the change of regime, a large number of institutions were dissolved, the number of researchers declined severely, and several thousands of researchers left the newly-formed countries to migrate to Western Europe and the United States.

Large-scale industry and the innovation networks with developed Western European linkages collapsed, financial resources of R&D were disrupted due to the emerging economic and political crisis. In more developed republics (Serbia and Croatia), the decline was between 15–30 per cent (Meske, 2004). Serbia's network of research institutions diminished considerably. There were 375 research institutes in Serbia in 1980, but their number fell to 163 by 2005. The number of business research and development organisations fell by one-third. The number of researchers was 35,000 at the end of the 1980s, and after a continuous decline reached its lowest point in 2001 with 19,000 researchers employed in the country (Kutalača, 2006). Afterwards followed a phase of slow growth only to initiate a new phase of decline in 2007 (Figure 4).

Similar trends could be detected in the other countries. During the final years of the former Yugoslavia the tendency of researchers to migrate abroad was already strong and further increased due to the war and the economic crisis. In Albania, the consequences of outward migration of professionals from the country were also severe. The University of Tiranë lost 40 per cent of its lecturers in the 1990s, the majority of whom were young professionals under the age of forty (Uvalić, 2006b).

Figure 4: Evolution of the number of R&D employees, 1996–2007



Source: UNESCO, Institute for Statistics.

The share of research in the national GDP was reduced to a minimum level in several republics. In Bosnia-Herzegovina, the share of R&D in GDP fell to 0.03 per cent in 2007 from the 1.5 percent in 1990. A major cause of the decline was the dissolution of Elektroinvest in Sarajevo, the flagship company of Yugoslav industry owning large export capacities and scientific potential. In 1990, 30 per cent of Bosnian industrial exports were constituted of products developed in research units of the republic, today this value is considerably lower (UNESCO Science Report, 2005).

R&D indices of Western Balkan countries present an unfavourable picture, both in terms of research expenditure and research employment data compared with European average performances (Table 4). Despite lagging behind in several areas, Croatia's research system shows the strongest resemblance to development trends in the European research area.

Table 4: Some important R&D indices in Western Balkan countries, 2007

	Albania	Bosnia-Herzegovina	Croatia	Macedonia	Montenegro	Serbia	EU-27
Researchers per million inhabitants	609	197	1,384	...	1,143	1,190	2,728
R&D expenditure in percentage of GDP	0.18	0.03	0.93	0.18	0.24	0.34	1.9
Distribution of R&D expenditure, percent	100.0	...	100.0	100.0	100.0	100.0	100.0
Business sector	1.0	...	23.5	11.0	5.5	1.7	64.0
Governmental sector	25.1	...	32.9	24.0	15.7	39.8	13.4
Higher education	73.9	...	43.6	65.0	78.8	58.5	22.6

Source: UNESCO, Institute for Statistics.

Weak innovation potential is a major reason of the low indices of competitiveness in Western Balkan countries. Based on the analysis of pillars of global competitiveness (health care, primary education, macroeconomic stability, higher education and training, development of the business sector, market efficiency, institutions, infrastructure, technological readiness and innovation performance), countries of the Balkans show a heterogeneous picture. The largest disproportions can be detected in the development level of infrastructure. Albania and Macedonia perform badly in each sector of infrastructure, and infrastructural networks of the previously relatively developed Bosnia-Herzegovina were destroyed during the war. Among the factors of competitiveness, innovativeness and technological receptiveness reveal the lowest values. Factors related to institutions of the market economy show a higher performance and continuous development, the tendency to Europeanisation is visible. Even though this leads to the permanent amelioration of external conditions of research and development, no such favourable changes have occurred in the private sector that would enhance the demand for new technologies.

Owing to the weak absorption capacities of the economy, the great bulk of research is financed by public funds in all the countries except Croatia. Higher education is regarded as the most prominent research sector in each country. Three-quarters of the research expenditure in Albania, and over 50 per cent in Serbia is related to universities. Universities have always fulfilled an important role in different phases of economic development in the area. For this reason,

technical, technological and engineering faculties operate with a large number of students in all the important regional university centres. However, the necessary conditions for establishing strong linkages between industrial companies and universities are still lacking in Balkan countries.

To rebuild Balkan economies, international community plans for the stabilisation of political conditions have highlighted the importance of the modernisation of training and higher education and the reorganisation of research and development. UNESCO provides permanent counselling in the area. Several large international companies elaborated strategies to keep qualified workforce in the area and to organise innovative training programmes at local universities. Every Balkan country has joined the research framework programmes of the European Union. European standards appear formally in the regulation of national institutions. In the mid 2000s new laws on higher education, research and development and innovation were implemented in all the countries. The development of the institutional system of research management has started. International counselling organisations have supported the elaboration of the first national scientific and research strategies. In Albania, Croatia and Serbia, medium-term research and development plans were accepted by the governments. Unfortunately national documents pay no attention to the large disproportions in the spatial location of R&D units.

Spatial disparities of the institutional system of research

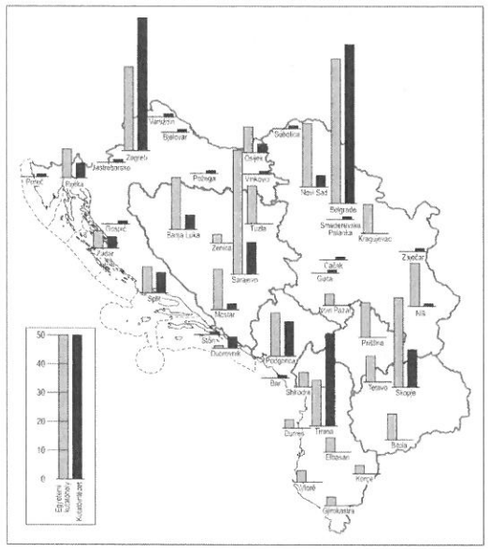
The presence of large spatial disparities hindering the development process characterises the organisational system of research as well. As a result of the concentration of higher education in the capital and the implantation of research units in higher education institutions, inner regions of the Balkan countries do not carry out research and development activities, several elements of the innovation chain are missing, endogenous resources of structural transformation of the economy are modest. The spatial location of research units in the region is shown in Figure 5.

Research capacities in Macedonia and Montenegro show the biggest concentration. With one exception, all the research units in Montenegro are located in the capital. Eighty-seven per cent of Macedonia's researchers are concentrated in the capital; the second most important research centre is Bitola, which – thanks to its university – provides 7 per cent of the country's researchers. The other research centres have but a 2–3 per cent share.

In the Balkan states with large populations, regional disparities in research and development are somewhat lower than in the former countries, yet compared to EU standards, they are still considerable. In terms of the number of research units, the weight of capital cities is two to three times higher than their share

in the country's population, exceeding 50 per cent (Table 5). Croatia is the only exception, where the degree of concentration in the capital is below 50 per cent. This is due to the presence of large universities outside the capital, technological and innovation centres implanted in the six provincial towns and research institutes and regional centres of the Croatian Academy of Sciences and Arts.

Figure 5: Regional distribution of research units in countries of the Western Balkans



Source: Author's own work based on Accessing and Disseminating Scientific Information in South Eastern Europe and various internet sites and national sources.

Table 5: Spatial structure of research institutions, 2005

	In the capital		Rest of the country		Total	
	University research unit, research institute, research centre				number	percentage
Country	number	percentage	number	percentage		
Albania	48	70.6	20	29.4	68	100
Bosnia-Herzegovina	81	76.6	29	23.4	110	100
Croatia	71	48.6	75	51.4	146	100
Macedonia	45	71.4	18	28.8	63	100
Montenegro	27	75.0	9	25.0	36	100
Serbia	105	64.4	58	35.6	163	100
Total	377	64.3	209	35.7	586	100

Note: Faculties are regarded as university research units.
Source: Author's own table based on Accessing and Disseminating Scientific Information in South Eastern Europe.

In the Balkan countries – similar to Eastern European states – the academies of sciences founded by the state have fulfilled an important role in science and the organisation of research. The Yugoslav Academy of Sciences and Arts (whose legal successor is the Serbian Academy) established local-regional academies in the former member republics in 1972. The Albanian Academy of Sciences was established at the same period. At present, the legal successors of these organisations operate as a combination of scientific societies and institutions fulfilling scientific management functions. Several academies operate their own research institutes. They are quite scarce and the number of their employees is low: 400 researchers are employed in 29 institutes and nine regional centres of the Croatian Academy of Sciences and Arts. The Serbian academy has ten research institutes and 250 researchers. The majority of academic institutions are engaged in social sciences (mostly humanities), their research activities focus on the analysis of national specificities.

Conclusion

The spatial structure of the intellectual potential of the Balkan countries does not permit a new development path of modern economy and society to be pursued. The professional qualification of labour in the spatial units of the nation states is low and shows significant disparities. The large concentration of higher education in the capital city fits into century-long historical trends. The professional profiles of newly-established universities were not designed on the basis of labour demand prognoses of the economic and social sectors but with an eye to political-ethnic aspects. One of the main strengths of the region is that in Serbia, technical and technological education has large-capacity regional university centres which may serve as driving forces of regional economic growth in the domains of training and research and development alike.

There is a lack of basic research institutions in large areas of the countries. Despite their relative development, capital cities do not serve as catalysts for regional economic growth. Research and development capacities of capital cities are below the average in international comparisons, neither the structure of institutions, the infrastructural capacities, nor are the level of financing sufficient to meet the requirements of the European research area. Research infrastructure in the current seven countries of Western Balkans is fragmented and does not fulfil the requirements of scale efficiency of international competitiveness. Therefore it is crucial to place a great emphasis on cooperation in the area of research.

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PART II
AGRICULTURAL ECONOMICS