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REGIONAL RESILIENCE: STRUCTURAL ANALYSIS, ENTREPRENEURSHIP AND SPECIALISATION

Regionalna otpornost – strukturna analiza, preduzetništvo i specijalizacija

Economic growth is the engine of the escape from poverty and material deprivation.
(Angus Deaton, winner of the Nobel Prize 2015)

Abstract

The recession did not affect all the regions with the same intensity, as some were more resilient than others. The differences in regional resilience, besides the labor market, have mostly reflected on regional branches of the manufacturing industry. Developed industrial branches within the manufacturing industry have been affected the most. In addition, key economic parameters (employment and value added) in the entrepreneurial sector decreased by 20%.

The in-depth research in the study is aiming in two directions: the testing of regional industrial resilience before and after the global recession and identifying of the key regional industrial branches in the context of regional specialization.

This study promotes a new methodological approach based on dynamic structural analysis of the manufacturing industry of Serbia. In addition, the research contribution of authors also encompasses the affirmation of new analytical instruments (two new composite indexes: RISI and Regional coefficient of successfulness of privatization).

The economic messages in this study are being targeted in several directions: regional resistance depends primarily on sectoral connections and endogenous regional resources, factors that increase regional resilience include technology, knowledge and innovation, and regional resistance is increased through the specialization of traditional branches of manufacturing industry. The economic transformation toward the entrepreneurial economy and dynamic company structures will be of crucial importance in the coming period.

Keywords: *regional resilience, regional effects of privatization, structural analysis, regional competitiveness, entrepreneurship, specialization of manufacturing industry*

Sažetak

Recesija nije podjednakom žestinom pogodila sve regione u Srbiji, neki regioni su bili otporniji od drugih. Razlike u regionalnoj otpornosti su se, pored tržišta rada, najviše odrazile u regionalnim granama prerađivačke industrije. Ekonomska kriza najviše je pogodila razvijene grane prerađivačke industrije. Pored toga, ključni ekonomski parametri (zaposlenost i novostvorena vrednost) su u preduzetničkom sektoru pali za 20%.

Dubinsko istraživanje regionalne otpornosti u Srbiji usmereno je u dva pravca: testiranje regionalne industrijske otpornosti pre i posle globalne recesije i identifikovanje ključnih regionalnih industrijskih grana u kontekstu regionalne specijalizacije.

U radu je promovisan i nov metodološki pristup baziran na dinamičkoj strukturnoj analizi prerađivačke industrije Srbije. Istraživački doprinos autora je i afirmacija novih analitičkih instrumenata (dva nova kompozitna indeksa: IRIS i Regionalni koeficijent uspešnosti privatizacije).

Ekonomske poruke u radu usmerene su u više pravaca: regionalna otpornost primarno zavisi od sektorske povezanosti i endogenih regionalnih resursa, regionalnu otpornost povećavaju faktori koje se odnose na tehnologiju, znanje i inovativni kapacitet, kao i da se regionalna otpornost povećava specijalizacijom tradicionalnih grana. U narednom periodu ključna će biti privredna transformacija ka preduzetničkoj ekonomiji i dinamičkim strukturama preduzeća.

Ključne reči: *regionalna otpornost, regionalni efekti privatizacije, strukturna analiza, regionalna konkurentnost, preduzetništvo, specijalizacija prerađivačke industrije*

Introduction

Cyclic movements are regularity in market economies. Therefore, in the following period we could expect cyclic disruptions both in Serbia and in the world market economy. The focus of economic policy is increasingly moving from short-term anti-crises policy towards structural policy. At the same time, the question of regional resilience now arises, which requires particular attention not only with the aim of carrying out the policy of employment and poverty reduction, but also with the aim of preventing possible future disturbances of decrease in demand and economic recession.

The global recession has not equally affected all regions in Serbia; some regions were more resilient than others. In some regions the unemployment significantly increased, while some other regions were more resilient and have not had a decline in unemployment. The regions in which the unemployment was low at the beginning of the crisis have been more hit than the regions in which the unemployment was high. Generally, there is a strong negative regional correlation between the unemployment before the crisis and the growth of unemployment. The effect of economic crisis on the regions with low unemployment was significantly stronger than on the regions with traditionally high unemployment. This has once again proved the economic rule that regional differences decrease in the period of recession.

The differences in regional resilience, besides the labor market [5], have mostly reflected on regional branches of

Figure 1: GDP trends

Source: Authors' calculations on the basis of the SORS data

the manufacturing industry [16], [4]. Developed industrial branches within the manufacturing industry have been affected the most.

The starting point hypothesis in this study is that regional resilience is the direct resultant of transitional processes, above all, of the privatization process. The in-depth research in the study is aiming in two directions: the testing of regional industrial resilience before and after the global recession and identifying of the key regional industrial branches in the context of regional specialization.

Economic growth and structural changes in Serbia

The transformation of Serbian economy is characterized by a few key factors: (a) unfinished and slow structural changes, (b) permanent spending beyond one's means, and (c) high unemployment as a resultant of unfinished structural changes in the economy. The transitional growth model was based on the domestic demand, foreign capital inflow, and the growth of service sector. New transformational model of the development of a country calls for the reduction of irrational spending, bureaucracy and unnecessary expenditures of public sectors, and, at the same time, the increase in investment spending in order to stimulate the economic growth and employment, simultaneously providing social protection of socially handicapped classes [18].

In the period before the crises, 2001-2008, Serbian GDP grew at the average rate of 5.9%, but it was not sufficient to overcome a deep production gap from the nineties of the previous century (see Figure 1). A great credit for the GDP growth goes to the service sector which generated almost 60% of gross value added of the economy, with the average annual rate of 5.4%. Positive transitional trends were stopped in the period of the gravest crisis from 2009 to 2012. In the period after the crisis, 2009-2014, GDP recorded the average fall of -0.2%. After the great fall of -3.1% in 2009, the economic activity has had an unstable trend. The gross domestic product has not yet reached the level from the period before the crisis.
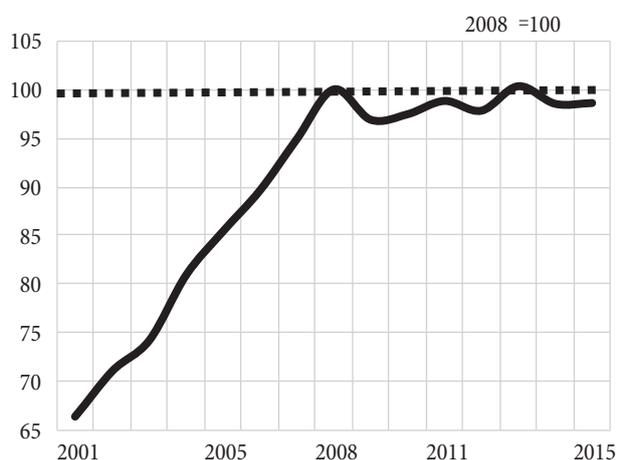
The effects of the global recession on the total area of South-East Europe (SEE) just confirmed the economic law that economic growth is not possible without continuous structural changes, i.e. "*structural changes are the central element of the development process and key element of the growth model*" (*Semën Abramovič Kuznec,* 1957). Macroeconomic imbalance of the SEE economy is, primarily, of structural character. The transformational models that were applied in the first decade of this century, after a decade of economic distortion and overdue pre-transitional start, did not make balance between a great amount of structural imbalance and systematic deformation, which had emerged vigorously under the influence of economic crisis. The consequences of an "*indebted economy*" model are manifested in all developmental dimensions, from demographic regression, industrial devastation, educational gap, to institutional underdevelopment (see Table 1). Positive signals of the application of the new model of economic growth, which is based on key structural reforms that were started last year, announce, despite the consequences of disastrous floods that affected economic sectors in 2014, higher economic growth in this year, and more importantly, sustainable economic growth in the years to come [17].

There are two crucial elements of the transformational model of economic growth in the previous period:

(1) Transitional model of economic growth was not based on structural changes in the manufacturing industry, but on the service sector expansion as well as on spending which each year constantly exceeded GDP by 15-20%, which was covered by import and, consequently, caused a large balance of payments deficit and unsustainable economic growth. Besides, the process of privatization and restructuring resulted in a high number of the unemployed. The initiated application of the new model of economic growth based on the industrial growth which is oriented to investments and export will contribute to the sustainability of economic growth.

The change of production structure (measured by indexes of structural changes, summarizing absolute differences of shares of sectors during the first and last year that were observed) took place intensively in the period

Table 1: Transitional macroeconomic balance of Serbia 2001-2015

Indicators	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Economic growth[1]	++	+	+	+++	++	+	++	+	-	+	+	-	+	-	+
Unemployment[2]	---	---	---	--	---	---	--	--	--	--	---	---	---	--	--
Life standard[3]	+	+++	++	++	+	++	+++	+	-	+	-	+	--	--	--
Industrial growth[4]	+	+	-	+++	+	++	++	+	-	+	+	-	+++	-	+++
Investments[5]	-	-	+	+	+	++	++	++	+	+	+	++	+	+	+
The privatization of large enterprises[6]	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-
Enterprise restructuring[7]	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-
Competition policy[8]	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-
Unit labor costs[9]			--	-	-	--	--	+	+	-	--	--	-	-	-
Inflation[10]	--	-	+	-	--	+	-	+	+	-	+	-	++	++	++
FDI[11]	-	-	+	-	+	+++	++	++	+	+	++	-	+	+	+
External debt[12]	---	-	-	-	--	--	--	--	--	--	--	---	--	--	---
The current account deficit[13]	-	+	-	--	-	-	-	---	---	--	--	--	-	-	-
Fiscal deficit/surplus[14]	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-

Legend:
[1] GDP growth: + less than 5%, ++ between 5-7%, +++ larger than 7%, - fall
[2] Unemployment rate: --- larger than 20%, -- larger than 15-20%
[3] Wages, real growth: +++ larger than 20%, ++ larger than 10-20%, + larger than 10%, - no growth, -- fall
[4] Industrial growth: - negative, + positive to 3%, ++ between 3-5%, +++ larger than 5%
[5] Investments in fixed assets (%GDP): - less than 15%, + 15-20%, ++ 20-25%
[6] The privatization of large enterprises (EBRD indicator): - without changes, + increase of 0.33
[7] Enterprise restructuring (EBRD indicator): without changes -, + increase of 0.33
[8] Competition policy (EBRD indicator): - without changes, + + increase of 0.33
[9] Unit labor costs: --- double-digit growth, -- growth 5-10%, - growth to 5%, + fall
[10] Inflation: -- more than 15%, - between 10-15%, + less than 10%, ++ below 5%
[11] FDI net: - less than $1bn, + between $1-2bn, ++ $2-3bn, +++ larger than $3bn
[12] External debt (%GDP): - to 60% GDP, -- 60-80% BDP, --- larger than 80% GDP
[13] Current account deficit: --- larger than 15% GDP, -- 10-15% GDP, - 5-10% GDP, + less than 5%
[14] Fiscal deficit/surplus: -deficit, - + surplus

2001-2005 when a decrease in the share of agriculture was recorded, but also the highest growth of services in GVA structure. Index measured by *the changes of employment structures* reached the highest value in the period of crisis.

Composite indicator of structural changes (see Figure 2), calculated as the average of the speed of structural changes of GVA and employment, indicates that, in the entire observed period from 2001 to 2014, the highest speed of changes was in the service sector, although the contribution of industry and construction industry should not be disregarded, primarily owing to the number of the employed in the years of economic crisis. In comparison with 2009, the number of the employed in the industry decreased by about 67 thousand, that is by 13.7%. A part of the dismissed employees was absorbed by the service sector (the number of the employed is higher by 0.4% compared to 2009).

(2) The speed of reforms – comparative analysis has shown that the economic growth was higher in those transitional economies in which reforms were carried out faster than in those with the strategy of gradual development. Transition indicator in Serbia remained at the level from 2010; therefore, the average mark of the progress in transition is unchanged [10].

Structural reforms

The process of structural reforms in the economy has not been finished. In the period before the crisis until 2008, economic activity and the service sector recorded high average growth rates of 5.9% and 5.4% respectively, while both economic activity and services stagnated in the period 2009-2014. There was a negligible growth in the manufacturing sector before the economic crisis, and in the period after the crisis the growth was a bit more dynamic. However, that growth was not big enough to close a great gap formed in the structure of gross value added (GVA). The economic structure reflects in the aggregate level of productivity. The greatest contribution to the productivity in the period 2001-2014 was achieved in the service sector (60.5% in 2014; 5.3 structural points more than in 2001). The share of the industry in total productivity achieved in Serbia in 2014 declined by 2.8 structural points compared to 2001. The growth of labor productivity of Serbia (the ratio of GVA and employment) of 8.3% in the period 2009-2014 is a result of the employment decline (-5.2%), and not of the efficiency of economic structure.

The main indicators of foreign trade after 2011 indicate deficit decline, improvement in the ratio between export and import and the level of openness of the economy, owing to larger growth of export relative to import. However, insufficient growth of export activities and unfavorable structure of export when it comes to technological progress of exported products have not changed yet.

In the period before the crisis the service sector grew faster than the manufacturing sector, which caused a huge gap in the structure of GVA (see Table 2). The industry achieved a negligible growth and significantly decreased its share in total GVA, as well as the agriculture.

Figure 2: Composite indicator of structural changes
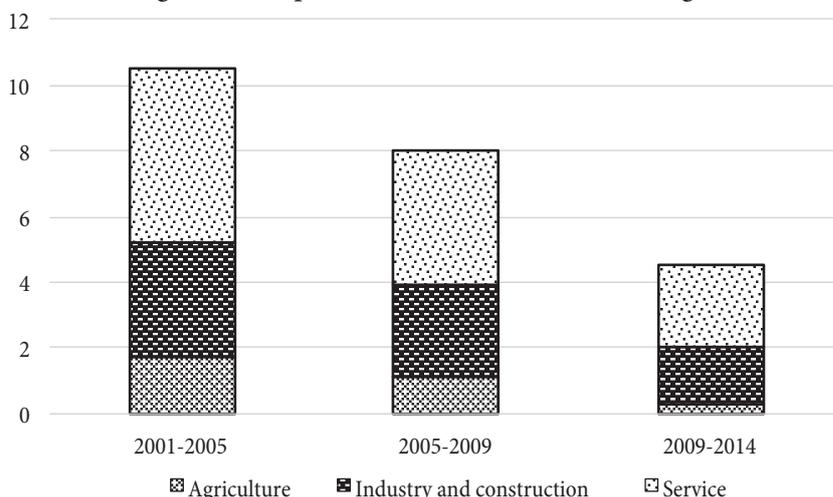
Source: Authors' calculations on the basis of the SORS data

Table 2: The sectoral structure of GVA

| Economy	The average growth rate		Change of share in GVA	
	2001-2008	2009-2014	2001-2009	2009-2014
Agriculture	1.8	0.5	-10.4	0.1
Industry	0.7	0.8	-5.2	1.7
Manufacturing industry	0.3	2.0	-8.6	2.4
Construction	9.6	-3.9	1.0	-0.6
Services	5.3	-0.2	14.6	-1.2
Trade	13.6	-1.9	6.2	-0.2
Traffic	6.9	0.2	0.6	-0.4
Information-Communication	11.4	1.2	2.1	0.3
Finance-Insurance	12.1	-2.8	2.2	-0.7
Real estate	1.8	0.4	-1.1	0.0
Other services	2.1	-	4.6	-0.2

Source: Authors' calculations

However, in the period 2009-2014, these trends changed. The services were slightly stagnating after the fall in 2009, and their fall of -0.5 % was recorded in 2014. In the industry sector, in the period after the crisis, the growth rate gradually increased, but this trend was stopped in 2014. The fall of -7.1% was recorded, due to the consequences of floods that hit Serbia in May, which mostly affected the subsectors of mining and energy industry. The construction sector has not recovered after the great fall in 2009 and in the whole period it recorded the average fall rate of -3.9%.

The difference in the share of GVA of manufacturing and service sector in total GVA has been changing since 2001 when agriculture, industry and construction industry had a greater share than total services (see Figure 3). Ever since, in the period 2001-2008, there was a noticeable growth of service activities and increase in GVA share.

In the manufacturing sector, on the contrary, there was a negligible growth of industry and agriculture compared to average economic growth of 5.9%, which had an influence on the decline in their share in new value creation. The service sector reached its maximum share in GVA of 61.7% in 2009, and manufacturing activities reached just 38.3%. After the crisis this ratio changed in favor of the manufacturing sector, due to low growth rates of the service sector and a bit more significant growth of industrial and agricultural sectors. This change would have been even more dynamic if there had not been a negative trend in the construction industry. However, one can only conclude that the manufacturing industry has not considerably recovered and improved its share in gross value added (at the beginning of transitional period the share of GVA made by the manufacturing industry accounted for 25% of total GVA, and in 2014 it was below 20%).

Figure 3: The structural gap in GVA
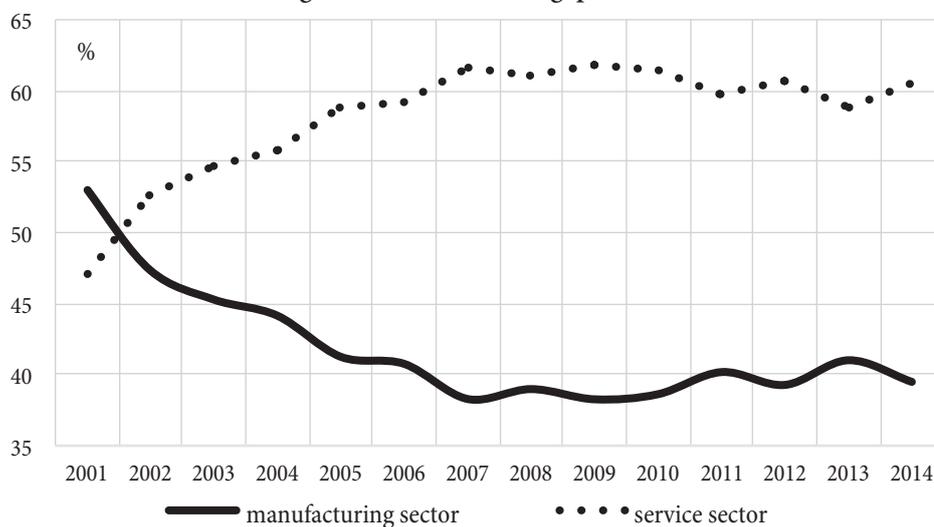
Source: Authors' calculations

The smallest gap between the manufacturing and service sector, in the period after the crisis, was recorded in 2013, but a big industrial decline in 2014 contributed to creating the difference which was in favor of services.

Comparative sectoral structure of GVA in the countries of our region shows that the sectoral structure of Serbian GVA is different because of a greater share of agriculture (only Macedonia and Montenegro are at a similar level) and due to a low share of services in gross value added (see Figure 4). Romanian economy stands out with its high share of industry and construction industry sectors and a very low share of service sector in total GVA, which is opposite to the tendencies in Montenegro, which has the lowest share of the industrial sector, and the largest share of services (like Croatia) amounting to about 70% of GVA, which is at EU-28 level.

## Regional effects of privatization

The process of privatization of the state capital in Serbia is in its final phase (the legal deadline was the end of 2015). The process of privatization of state-owned companies, the remainder of public companies of special interest, as well as of specific industry companies is yet to come. The privatization of 17 companies of strategic importance, as well as companies from the territory of AP Kosovo and Metohija is also yet to come.

The most attractive companies were sold at the very beginning of privatization process, during 2002 and 2003. The analysis of the effect of privatization takes some time.

Namely, the analysis of the effects of cost consolidation takes a year, the analysis of the effects of privatization on productivity and reduction of labor costs takes from one to two years, while the analysis of the effects of privatization on gross value added takes a period longer than two years [25]. Generally, the biggest burden of privatization was carried by the employees in the manufacturing industry. The average annual decrease in the number of employees in manufacturing industry in the period 2001-2014 was 5.8% – from 604,054 employees in manufacturing industry in 2001 the number of employees dropped to 279,289 in 2014. Having in mind that about 4,000 companies were under the jurisdiction of the Privatization Agency, the assessment of the efficiency of privatization in Serbia in the period 2002-2015 could be summarized by the following facts:

- 2,389 companies were privatized, the income made by the privatization was EUR 2.6 billion and by the contracted investments EUR 1.0 billion (excluding 688 annulled privatizations done through bidding and auction procedures);
- The selling of the state capital was successfully finalized in 2/3 of companies – *coefficient of the successfulness of the privatization of Serbian companies is 60.1%*;
- More than 1,000 companies (about 27%) with the state capital went bankrupt;
- There are about 500 companies left to be privatized according to the new Law on Privatization.

Regional analysis of the privatization process in the period 2002-2015 shows (see Table 3 and Figure 5):

Figure 4: Comparative sectoral structure of GVA, 2014
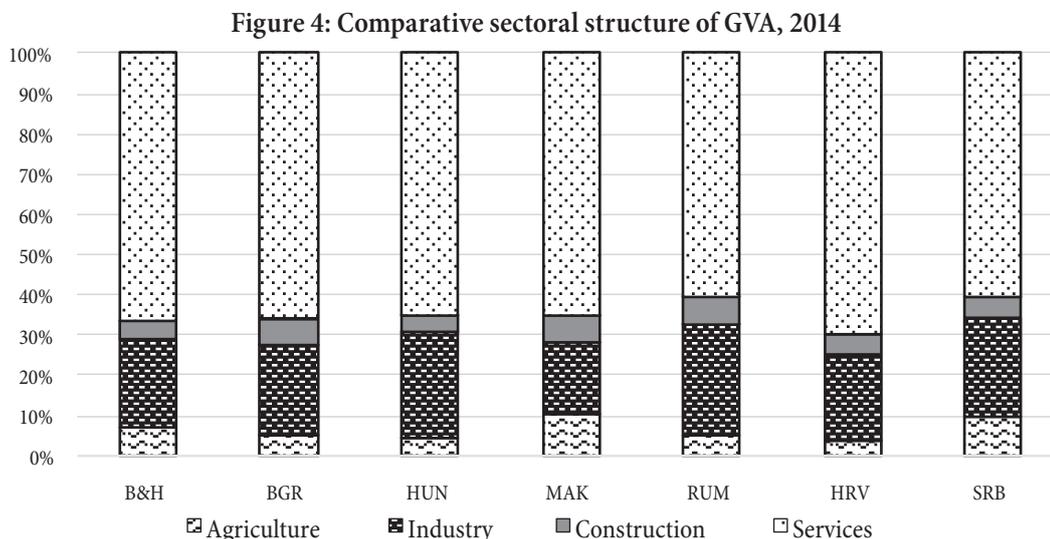
Source: Authors' calculations

- The privatized companies are mostly from the territory of Belgrade and Backa region (1,060 companies or 45.3%), where the income made by privatization was EUR 1.2 billion (47.7%). In these regions there was the highest number of terminations (233 or 33.9%). The biggest share of annulled privatizations through bidding and auction procedures in the number of signed contracts was registered in Jablanica-Pcinja region (38.3%) and in Nis-Toplica-Pirot region (34.5%);

- Privatization was the most successful in North-Banat region, Middle-Banat and South-Banat district (more than 70% of companies were successfully sold through the privatization);

- The lowest coefficient of successfulness of privatization was in Pirot district (30.5%), Toplica (43.2%) and Bor districts (43.1%);

- The lowest share of terminated contracts in the total number of signed contracts (less than 15%) was in North-Banat, Middle-Banat and Branicevo districts;

- The worst coefficient of annulled privatization was in the south of Serbia – Pirot district (30.5%) and Jablanica district (44.5%).

Entrepreneurship and regional resilience

Current literature on entrepreneurship offers a good insight of how economic crisis influences the number and the structure of newly established companies. The results of empirical research indicate that, due to global financial crises, the number of registered companies has declined in most of the countries. Moreover, this decline is higher in developed countries and in countries where entrepreneurial sector is more dependent on financial institutions [19]. Besides that, the results of empirical research show that small- and medium-sized enterprises reduce the number of employees during the global financial crisis [7]. However,

Figure 5: Regional coefficient of successfulness of privatization 2002-2015

Source: Authors' calculations

Table 3: Regional balance of privatization in Serbia, 2002-2015

District	Number of privatized companies	Number of canceled	Non-privatized	% canceled	% success
Belgrade	600	115	157	16.1	64.6
Backa	460	118	60	20.4	67.7
Banat	309	73	48	19.1	66.6
Srem	79	29	16	26.9	61.7
Macva-Kolubara	131	35	18	21.1	56.0
Sumadija-Pomoravlje	103	33	27	24.3	54.5
Zlatibor-Moravica	167	60	21	26.4	57.2
Raska-Rasina	108	51	40	32.1	55.4
Podunavlje-Brancevo	96	20	24	17.2	56.1
Bor-Zajecar	70	32	15	31.4	45.2
Nis-Toplica-Pirot	129	68	31	34.5	43.6
Jablanica-Pcinja	87	54	28	38.3	46.3

Source: Authors' calculations on the basis of the AP data

according to the Global Entrepreneurship Monitor, there is no sharp change in entrepreneur's response to the global financial crises as regards the perception of business opportunities since the proportion of the entrepreneurs engaging in nascent ventures have not changed significantly. The literature devoted to exit of small independent firms highlights their vulnerability in terms of their liabilities or their resilience, which is understood as flexibility or adaptability. According to the hypothesis of small firm vulnerability, the exit rate is higher, whereas according to the hypothesis of small firm resilience, small firms are less affected by the crisis [8], [2].

In Serbia the waves of recession have stopped the growth of entrepreneurship sector and positive trends in transitional recovery. Recession had the first negative effects on the decrease of employment and they later spread to the other segments of business efficiency and the level of investment activities of the entrepreneurship sector. Summary assessment for the period from 2008 to 2014 indicates that in 2014, the values of all the key efficiency indicators (turnover, GVA, profit) were lower in comparison to the ones at the beginning of recession (see Figure 6).

Business process analysis shows that the negative effects of recession are stronger in entrepreneurship sector than in large enterprises. For instance, in 2014 GVA decreased by 19.8% and employment decreased by 19% in the entrepreneurship sector. Due to intensive employment decline (by 16% in the economy and 9.8% in large enterprises) and since decrease of GVA (by 15.4% and 9.1%, respectively) the rest of the economy has achieved modest growth of productivity, but the low level of productivity is still the main characteristic of Serbian economy.

Growth of productivity in the entrepreneurship sector continued (it was stopped in 2013) due to an increase in GVA, especially in micro enterprises and entrepreneurs (by 10.2% and 4.5% respectively compared to 2013). The problem becomes more complex with the fact that, in this period, net income growth was not in accordance with productivity growth. However, entrepreneurship sector continually had a gross income below the economy average (88.2% in 2008 and 90.4% in 2014), whereas the incomes of large enterprises were always above the economy average (by 24.1% in 2008 and 17.7% in 2014).

This slow dynamic of the recovery from recession of the whole economy is more noticeable in small and medium-sized enterprises than in large enterprises. In comparison to 2013, real decrease of employment, turnover and GVA in large enterprises is considerably smaller than in small and medium-sized enterprises. Negative tendencies displayed

Figure 6: Resilience in entrepreneurial sector to external shocks
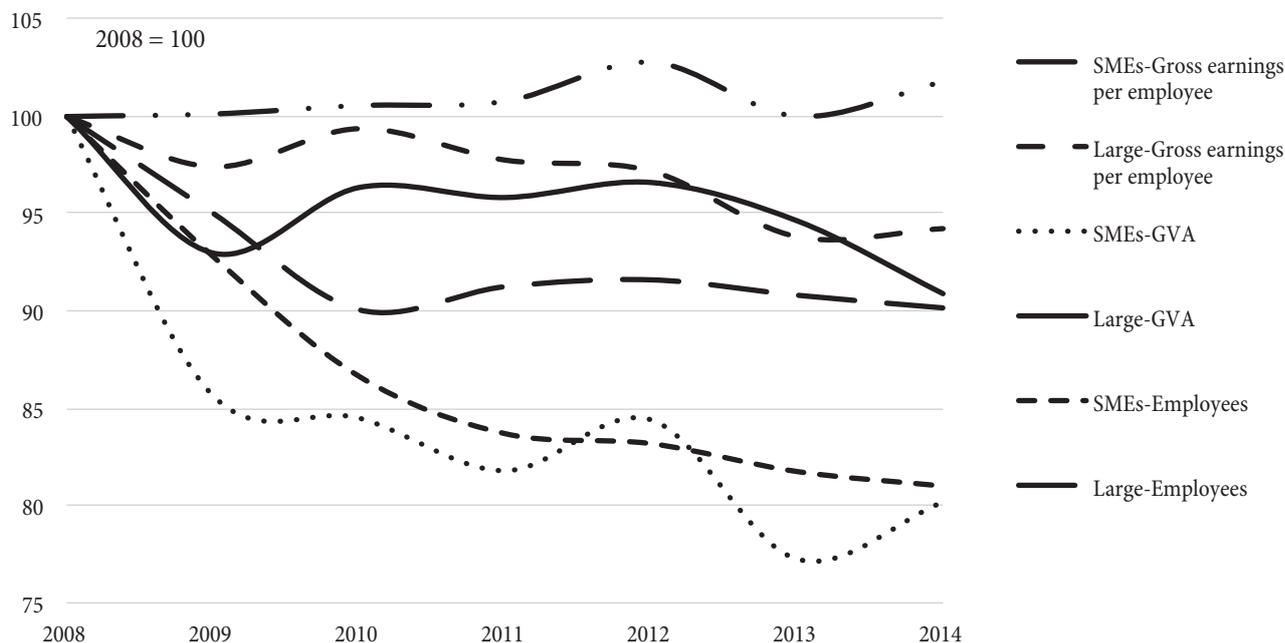
Source: Authors' calculations on the basis of the SORS data

in the level of development of the entrepreneurship sector are highly important because these enterprises (324,272) were heavily involved in forming the basic indicators of Serbian economic activity. The road to the recovery of economy is through structural reforms and without them the necessary economic growth will not be possible. What is needed for a more dynamic development of the entrepreneurship sector is a continuous improvement of business environment, starting with a more efficient conduct of structural reforms, rationalization of the oversized public sector, increase in financial discipline, etc. [19].

The most illustrative analysis of regional resilience in the entrepreneurship sector in the post-crisis period shows business demography through the relations of established and closed enterprises and stores (see Figure 7). Net effects of enterprises from 2008 to 2015 are considerably higher than the net effects of stores (the average net effects for enterprises in Serbia are 1.7 and almost no net effects for stores). Regional analysis shows extreme unevenness of the conditions for establishing new economic entities and the development of the existing ones (enterprises and entrepreneurs). The highest business dynamics from 2008

to 2015 was registered in the developed regions (Belgrade, South Backa, Srem and Sumadija). 38,130 enterprises were founded in Belgrade and 18,163 enterprises were closed down (net effect of 2.1). In this period, in North Backa region 2,537 enterprises were founded and 1,718 enterprises were closed down (net effect of 1.8) whereas in Jablanica region net effect of new enterprises was just 1.1 (861 new and 780 closed-down enterprises). The worst business conditions in the post-crisis period are in the least developed regions.

Regional specialization

Theoretical framework

Global recession has affected the creation of completely new regional production and organizational rules with the promotion of different forms of specialization in the foreground, primarily regional clusters. In theory, regional clusters could be defined as a regional institutional concentration of economic entities that have formed mutual horizontal and vertical relations [3], [6]. Marshall's Agglomeration Theory [24] offers the first theoretical

Figure 7: Regional business demography, 2008-2015
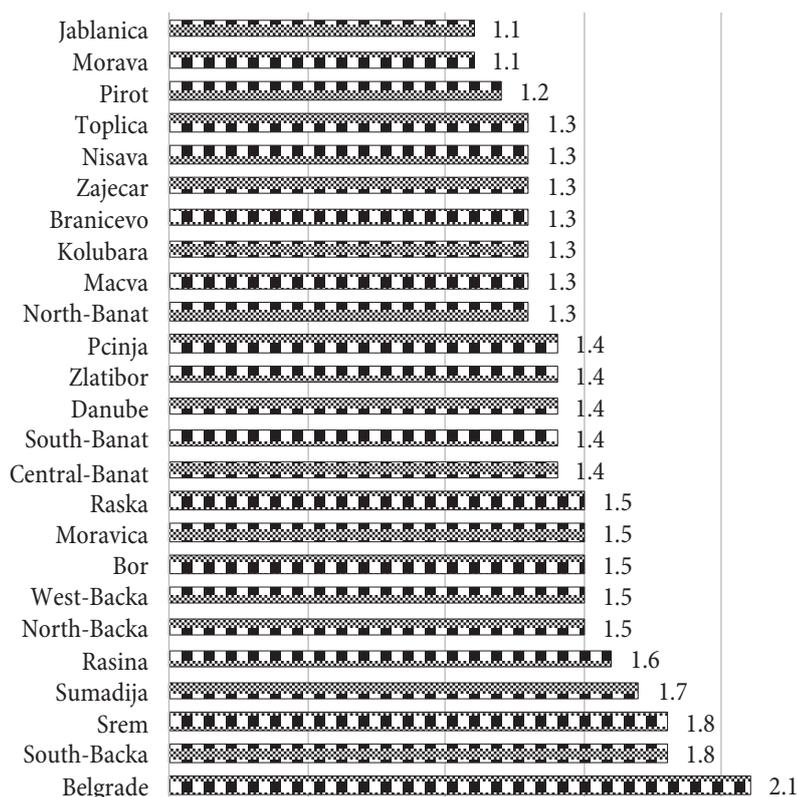
Source: Authors' calculations on the basis of the SBRA data

basics of regional specialization, more precisely in his reflections on *"the regional production systems in industrial districts."* Endogenous growth theory that is based on the multiplier effects and cumulative causation has had the greatest impact on expanding the theory of regional clusters [22]. At the end of the last century, economic geography deliberately excluded the social and institutional basics of regional specialization [15].

However, in the past decade there has been a real explosion of studies of social and institutional inveteracy of regional specialization [12], [13], [14].

The theoretical focus is still on the questions of why regional specialization appears, and why it disappears, as well as the question of why regional specialization is constantly reaching higher, more profitable levels or in other words the processes of regional specialization have a tendency to attract new institutions and enterprises. Besides typical economic performances such as regional GDP, employment and standard of living, scientists are more interested in the structural changes in regional specialization. Every regional specialization is a specific configuration which depends on the regional institutional and production factors, and industrial factors above all. Having in mind that the theoretical focus in the research of the structural changes is on regional specialization, i.e. clusters, a number of theoreticians are reaffirming the exogenous factors again (transport and production expenses). In the context of the above mentioned, the impact of direct foreign investment on regional specialization was studied in transitional countries [9]. Generally, regional specialization theoreticians, who base their opinions on the multiplier effects and cumulative causation, still have a dominant influence [29]. A number of theoreticians analyze the combination of both endogenous and exogenous factors [16]. Typical examples of this are many regional high-tech industry clusters (a combination of regional political and technological changes), regional knowledge clusters (a combination of highly qualified workforce and high technology influenced by FDI), regional SME clusters, regional clusters as a combination of the old and new technologies (regional ICT clusters in Scandinavian countries).

Regardless of the various forms of regional specialization (regional innovation clusters, regional industrial districts, MSP clusters, regional profit centers), the main terms are (see Figure 8): location factors, vertical and horizontal connections between the companies, interaction with the key educational and innovation institutions, openness and a quick adjustment to changes [29], [12]. Regional specialization increases regional competitiveness and enables local enterprises to enter new markets and gain a quicker access to new sources of finance. Through regional specialization, regional enterprises directly influence the rise in productivity of the whole region. Of course, the most important factor is the connection with the centers for scientific research.

Figure 8: Factors of regional industrial specialization
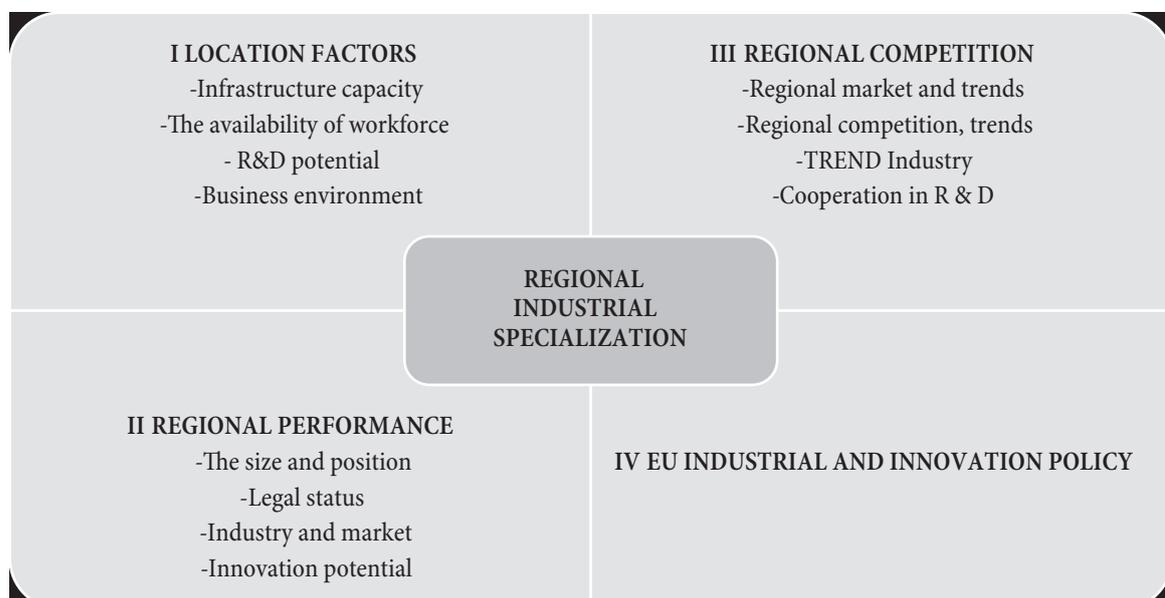
Various forms of regional specialization have made contribution to economic development and the European Union experiences in these cases have been very diverse [4], [5]. Many regions have valorized their comparative advantages through regional specialization [1]. Stimulation of the development of clusters in the European Union is mainly given through regional politics, entrepreneurship development policies, research and innovation policies as well as the conduct of different programmes such as: "The Competitiveness Innovation Programme", "7th Framework Programme", "Observatory of European SMEs", etc., which promote various regional specialization measures and activities. Today, almost 50% of the EU employees work in different types of regional specialization.

Methodological approach

The European Cluster Observatory, for regional competitiveness analysis, uses the methodology of three stars [11]. In a study of regional resilience and regional specialization authors have applied the new methodology. Applied regional industrial specialization methodology differs from the methodology that is used by the European Cluster Observatory because it explores not only employment dimension, but regional competitiveness dimension as well and, most importantly, it has dynamic approach – it takes into consideration structural changes in manufacturing industry before and after the global recession effects (2008 and 2013).

Methodological concept of defining Regional Industrial Specialization Index (RISI) is based on the dynamic economy analysis of regional branches of the manufacturing industry. RISI has two dimensions:

- *Regional resilience* which is measured by changes in employment in branches of the manufacturing industry in 2008 and 2013, using the following criteria:
  - Employment in a specific branch of industry must be higher or equal to 10% employment of the very branch at the national level;
  - Employment in a specific branch of industry must be higher or equal to 3% of total employment in the economy of the region.
- *Regional competitiveness* which is measured by changes of gross value added (GVA) in branches of

manufacturing industry in 2008 and 2013, using the following criteria:
  - GVA in a specific branch of industry must be higher or equal to 10% GVA of the very branch at the national level;
  - GVA in a specific branch of industry must be higher or equal to 3% of total GVA of the economy of the region.
- *Regional specialization* has both dimensions, individual and collective. If the industrial branches of manufacturing industry fulfil the criteria of regional resilience, they get one star (*). If they fulfil the criteria of regional competitiveness, they get two stars (**). If they fulfil both criteria, they get three stars (***). In the case of Belgrade, due to specificity of the size and dominance of a large number of branches, a less strict criterion of a specific branch employment and GVA in the city economy has been applied.

Regional areas (12) are formed by grouping the districts which are similar in their representative economic, demographic, social and spatial performances.

Research findings

Value added in manufacturing industry for the whole transitional period was modest. The average growth rate of manufacturing industry for the whole period from 2001 to 2014 was only 0.2% (see Figure 9). Transitional restructuring of manufacturing industry mainly came down to rationalization of the industry workforce, cutting the number of "redundancies". In the post-crisis period, Serbian manufacturing industry faced some additional challenges, namely in the period of 2009 to 2014 there were about 50,000 fewer employees in Serbian manufacturing industry.

Industrial employment drastically decreased in the least industrially developed regional areas (see Figure 10): Jablanica-Pcinja (-43%) and Raska-Rasina (-33%), but it decreased in the most industrially developed regional areas as well, such as Belgrade (-30%) and Backa (-33%). The most drastic post-crisis decrease in value added in manufacturing industry was in the regional areas Jablanica-Pcinja (-54%) and Sumadija-Pomoravlje (-47%). Owing to direct foreign investment some regional areas proved to

Figure 9: The structure of manufacturing in Serbia
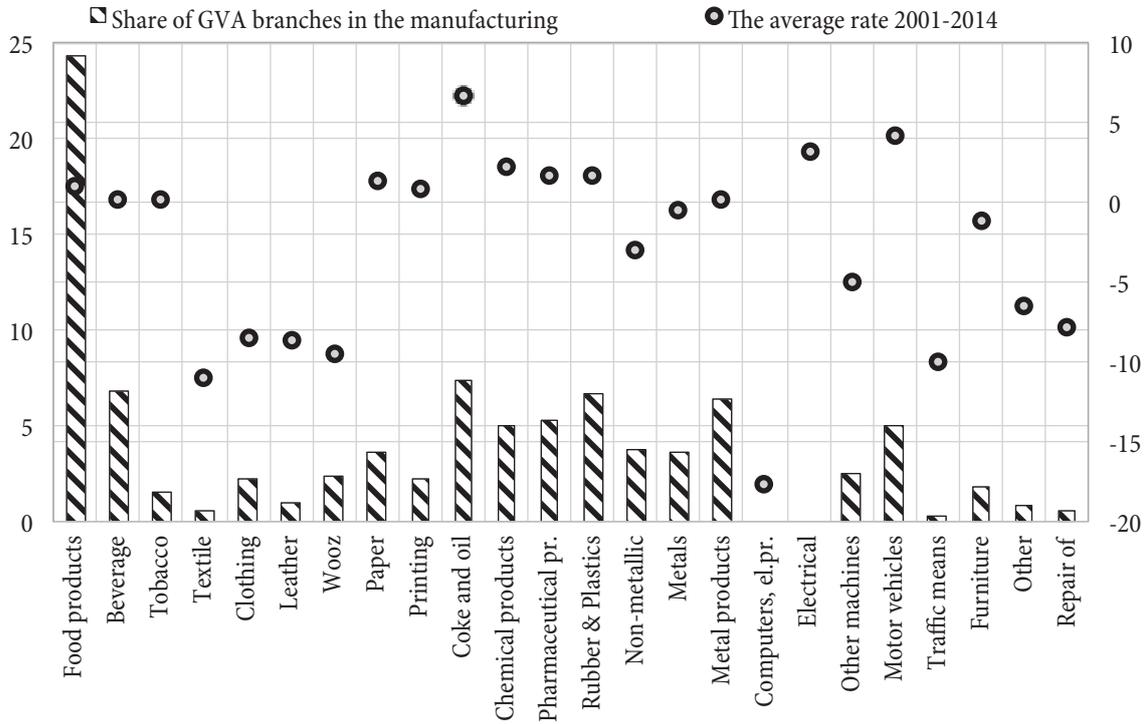
Source: Authors' calculations on the basis of the SBRA data

Figure 10: Regional balance of the manufacturing, 2008-2013
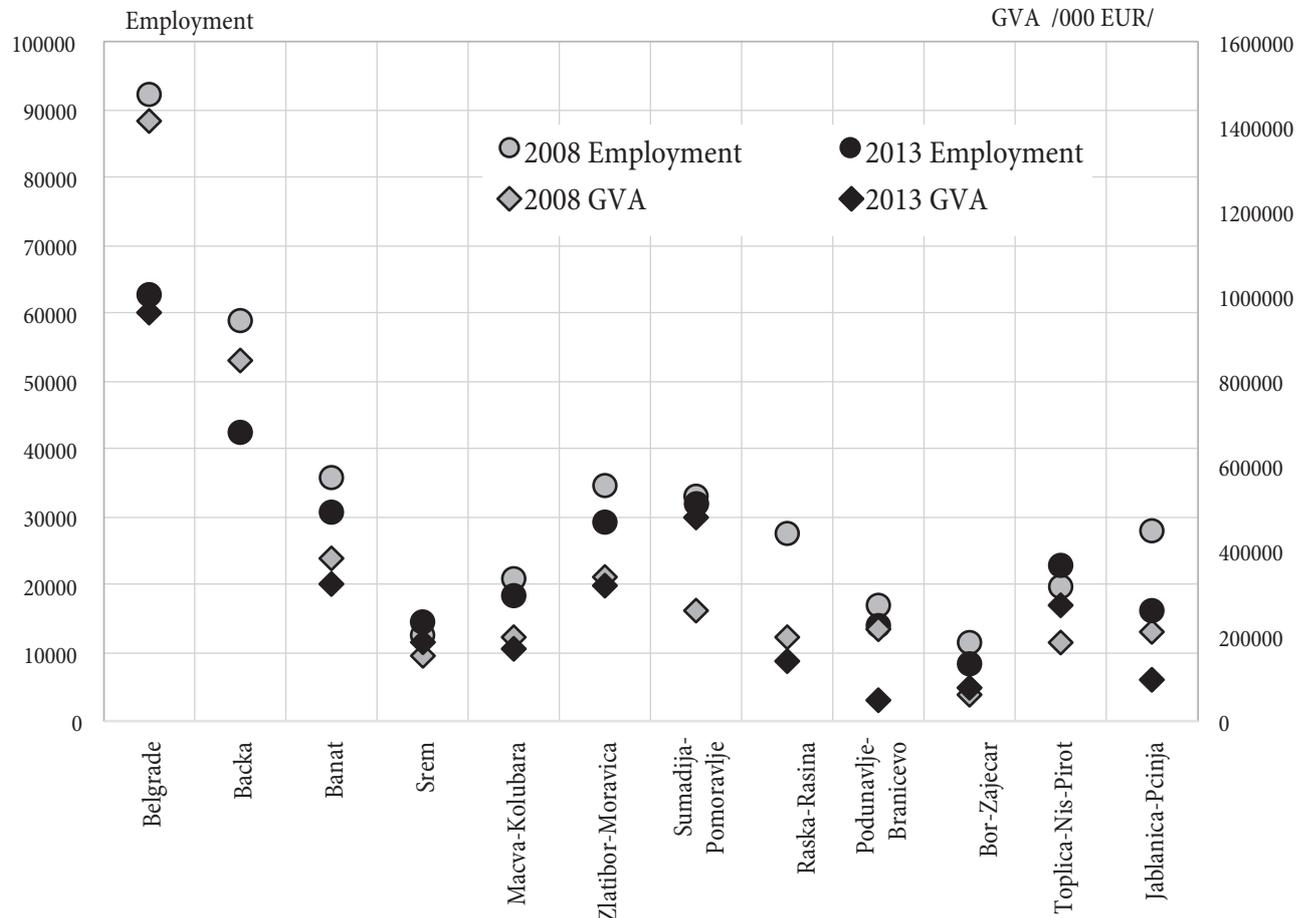
Source: Authors' calculations on the basis of the SBRA data

be more resilient, namely they increased the number of employees and GVA in manufacturing industry in that period. In regional area Srem the number of employees increased by 8% and GVA increased by 26% and in regional area Nis-Toplica-Pirot the number of employees increased by 17% and GVA increased by 45%.

However, given the circumstances some branches of industry proved to be more resilient than the others, and some branches of industry proved to be more competitive than the others (see Table 3 as well as Figures 11 and 12). Regional dynamic industry analysis took into consideration two time points: final statements of accounts of all enterprises were examined: 2008 (upper transitional point) and 2013 (time point 5 years after recession began).

Regional resilience – branches of industry with one *

- Regional areas with a higher regional privatization efficiency quotient have more resilient branches of industry;

- In the undeveloped regions, the traditional branches of industry preserved regional resilience;

- Resilient branches of the developed regions participated in their regional economy to a much lesser degree than resilient branches did in the undeveloped regions (see Table 4). For instance, a branch of industry – *Meat Processing and Preservation* in Backa makes 50% of the employment in Serbia in that branch, but only 3.3% in Backa itself. Contrary to this, in Jablanica-Pcinja region *Furniture industry* branch makes 13.1% of that region employment, whereas at the national level it makes 33.9% of the employment in Furniture industry branch.
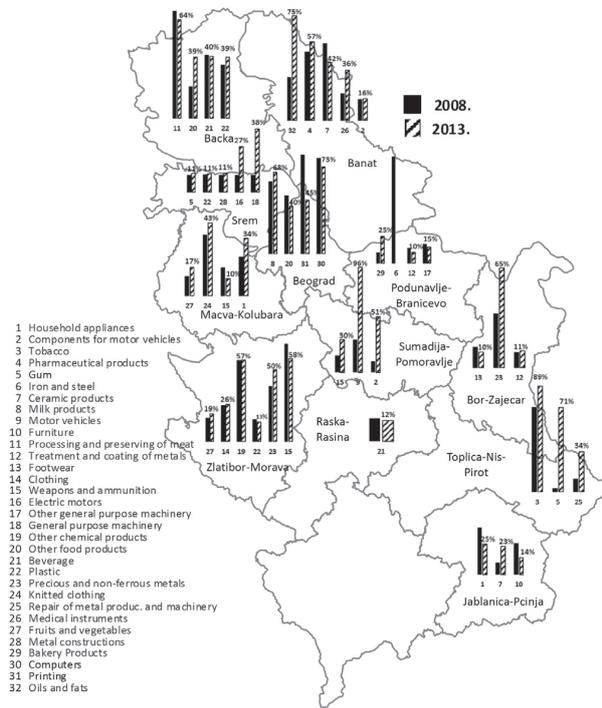
Regional competitiveness – branches of industry with two **

- There is a significant correlation between privatization efficiency quotient and competitive branches. Namely, regional areas with a higher regional privatization

Table 4: Resilience, competitive and specialized branches

	Manufacturing industries	Resilient	Competitive	Specialization
Beograd	Dairy products, Other food products	*	**	***
	Printing, Computers	*		*
Backa	Processing and preserving of meat, Plastic	*	**	***
	Other food products	*		*
	Beverage		**	**
Banat	Basic chemicals, Pharmaceutical products, Components for motor vehicles	*	**	***
	Oils and fats, Medical instruments		**	**
Srem	Gum, Plastic	*	**	***
	Metal constructions, Electric motors, General purpose machinery		*	*
Macva-Kolubara	Fruits and vegetables, Knitted clothing, Weapons and ammunition	*	**	***
	Footwear	*		*
	Household appliances		**	**
Zlatibor-Morava	Fruits and vegetables, Clothing, Other chemical products, Plastic, Precious and non-ferrous metals, Weapons and ammunition	*	**	***
	Motor vehicles	*		*
Sumadija-Pomoravlje	Weapons and ammunition, Motor vehicles, Components for motor vehicles	*	**	***
	Wire and cable equipment, Furniture	*		*
Raska-Rasina	Beverage	*	**	***
	Gum, Components for motor vehicles Other machines for special purposes, Other general purpose machinery	*		*
Podunavlje-Branicevo	Iron and steel, Treatment and coating of metals	*	**	***
	Bakery Products		**	**
Bor-Zajecar	Footwear, Precious and non-ferrous metals, Treatment and coating of metals	*	**	***
Toplica-Nis-Pirot	Tobacco, Repair of metal products and machinery	*	**	***
	Clothing	*		*
	Gum		**	**
Jablanica-Pcinja	Household appliances, Furniture	*	**	***
	Textile fibers, Footwear	*		*
	Ceramic products, Pharmaceutical products		**	**

Figure 11: Regional resilience – employment

1 Household appliances
2 Components for motor vehicles
3 Tobacco
4 Pharmaceutical products
5 Gum
6 Iron and steel
7 Ceramic products
8 Milk products
9 Motor vehicles
10 Furniture
11 Processing and preserving of meat
12 Treatment and coating of metals
13 Footwear
14 Clothing
15 Weapons and ammunition
16 Electric motors
17 Other general purpose machinery
18 General purpose machinery
19 Other chemical products
20 Other food products
21 Beverage
22 Plastic
23 Precious and non-ferrous metals
24 Knitted clothing
25 Repair of metal produc. and machinery
26 Medical instruments
27 Fruits and vegetables
28 Metal constructions
29 Bakery Products
30 Computers
31 Printing
32 Oils and fats

Figure 12: Regional competitiveness – GVA

1 Household appliances
2 Components for motor vehicles
3 Tobacco
4 Pharmaceutical products
5 Gum
6 Iron and steel
7 Ceramic products
8 Milk products
9 Motor vehicles
10 Furniture
11 Processing and preserving of meat
12 Treatment and coating of metals
13 Footwear
14 Clothing
15 Weapons and ammunition
16 Basic chemicals
17 Other general purpose machinery
18 Other machines for special purposes
19 Other chemical products
20 Other food products
21 Beverage
22 Plastic
23 Precious and non-ferrous metals
24 Knitted clothing
25 Repair of metal produc. and machinery
26 Textile fibers
27 Fruits and vegetables
28 Wire and cable equipment

efficiency quotient have more resilient branches of industry;

- Owing to direct foreign investment and direct national incentive measures in some regional areas, positive structural changes were made in the economic structures of these areas. What increased and changed the structure of value added was expanding new production capacity of branches of industry of the following regional areas (see Table 4): Srem (*Metal constructions*, *Electric motors*, *General purpose machines*, *Tools and equipment for motor vehicles*), Toplica-Nis-Pirot (*Textile industry*, *Production of rubber-made products*, *Maintenance of metal products and machines*), Macva-Kolubara (*Household appliances*), Banat (*Medical device industry*), Bor-Zajecar (*Metal processing machines*), Podunavlje-Branicevo (*Bakery and pasta production*).

Regional specialization – branches of industry with three***

- Developed regional areas have a diversified industrial structure with a lower regional specialization;
- Undeveloped regional areas have a significantly higher degree of regional specialization;
- Regional specialization is under the strong influence of privatization efficiency quotient;
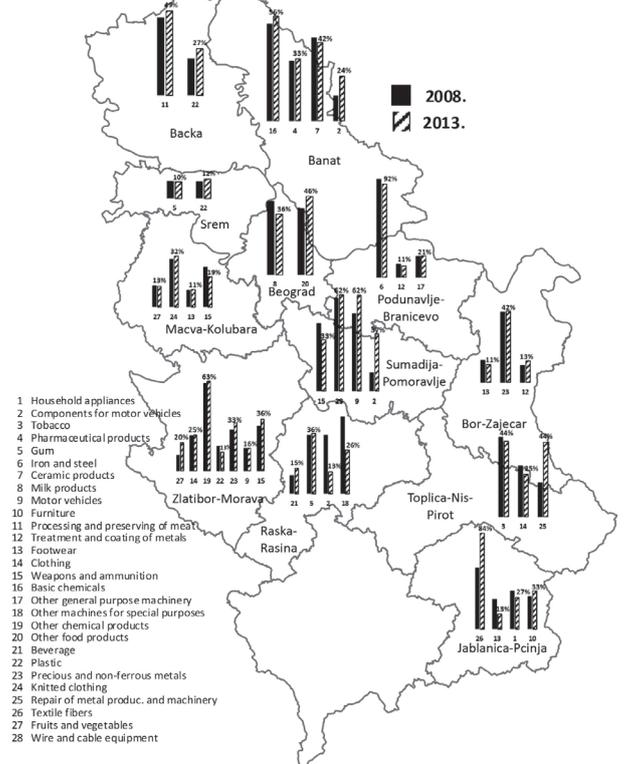
- Dominance factor of a branch of industry (more than 3% of employment or GVA in the economy of the region) is more present in the undeveloped regions;
- Regional specialization is still greatly influenced by regional resilience of the traditional branches of industry;
- Regional specialization in developed regional areas is more competitive than the one in undeveloped regions (see Table 4). For instance, in 2008 *Meat industry* in Backa made EUR 74 million and in 2013 it made EUR 69 million, whereas in 2008 *Furniture industry* in Jablanica-Pcinja made GVA of EUR 26 million and only EUR 11 million in 2013.

Conclusion

"*If an economic activity is orientated only towards the area of one city, without connections with its wider environment, it certainly cannot reach the necessary level of efficiency, because this closed market is so small that it limits the level of specialization*"

A. Smith, The Wealth of Nations [p. 122]

In regional economy term *regional resilience* denotes resistance (elasticity, power of endurance) of regions to different types of shocks. The very concept of regional resilience became popular after the global recession. It encompasses a few phases: getting back to the balance, adaptation and recovery. The concept of regional resilience is trying to answer a question raised by various scientific disciplines (economics, sociology, etc.): Why do some regions succeed in overcoming the waves of recession and keep their life standards, while some others do not? Regional disproportions are a resultant of competitiveness factors. The factors of agglomeration, human capital and institutions are the primary factors. Structural economic changes in the region, as well as how different factors increase or decrease vulnerability of a region to external impacts, are in the focus of the research.

What promotes economic growth of region better – specialization or diversification of regions? Theoretical considerations are divided, while some theorists claim that regional diversification increases regional resilience [6], the others advocate the claim that traditional regional specialization may serve as a source of economic resilience [29]. Both groups agree on the following:

- Regional resilience mostly depends on sectoral connectedness [27], i.e. regional resilience is larger if there is a higher level of sectoral (branch) connectedness of economic structures;
- Regional resilience is increased by the factors which refer to technologies and knowledge, the share of new products and services, innovative capacity [5];
- Endogenous regional resources are primary factors which increase regional resilience – infrastructure, educational institutions, human capital, entrepreneurial capacity and financial capacity [6]. Increasingly important factor is 'entrepreneurial culture of regions' [30];
- Regional resilience increases by specialization of traditional branches, since they are less subject to external shocks [2];
- Resilient regions are those with institutional capacities capable of fast adaptation to the changed external circumstances and capable of alleviating the negative effects [13]. In the most developed economies the

regions which have developed cooperation between public, private and non-profit sectors are the most resilient.

For a country in transition with clearly noticeable regional social-economic unevenness, such as Serbia, it is highly important to examine the resilience of a region. Regional policy and incentive mechanisms may be efficient only if they have regional performances during economic cycles. Institutional interventions do not have the same effects in different regions, that is why it is important to examine all factors of regional resilience. The recession did not affect all the regions with the same intensity, some were more resilient than others. The research had a goal to identify regional industrial capacities which could explain the specific performances of these regions.

The authors of the study have bridged the definition of economic region using Samuelson's 'law of one price' – it is an area in which the prices of production factors are integrated/similar. The research was carried out in 12 regional areas (NUTS III) in this context.

The main results of the dynamic research of regional industrial structures in Serbia in 2008 and 2013:

- Regional industrial resilience is a resultant of transitional processes in the industry of Serbia;
- In underdeveloped regional areas productivity has improved in labor-intensive branches, while there has been a significant productivity improvement in capital-intensive industrial branches in the developed regional areas;
- Regional resilience in poorer regional areas was based on traditional industrial branches;
- Regional diversification is significantly greater in developed regional areas. There has been a dispersal of the manufacturing sector which encompasses numerous production services;
- FDI has increased regional competitiveness of some regional areas thanks to the investments in branches with the greater share of value added;
- In developed regional areas there is a lower level of regional industrial specialization;
- Underdeveloped regional areas have an importantly higher level of specialization;

- Dominance factor of an industrial branch – more than 3% of employment or GVA in economy of a region – is more present in underdeveloped regional areas;
- Regional specialization is still under a considerably greater influence made by regional resilience of traditional industrial branches;
- Regional specialization in developed regional areas is more competitive than in underdeveloped regions.

Finally, the findings of the research of regional resilience impose the need for re-examining the existing institutions, policies and measures. Regional transformation orientated towards higher resilience increases by valorization of endogenous resources and mutual institutional performance of stimulating, educational, scientific-technological and innovative policy. The economic transformation oriented towards entrepreneurial economy and the structure of companies will be crucial in the following period [21]. Innovations and entrepreneurship are in the focus as generators of economic development. The traditional model of entrepreneurship is changing (economy of scales, traditional industrial branches, 'top-down' management). New entrepreneurs are not copies of big global companies, but the motivators of new innovative processes.

Specialization of the region in Serbia is now in the initial phase. Although there is an obvious influence of a multiplied effect which a country gets with economic specialization of the region, the incentive policy encounters numerous limitations, from unfinished structural changes in economy, absence of main economic infrastructure, undeveloped public-private dialogue and partnership between the government, economy and scientific and research institutions at a local, regional and national level.

Regional development of a country should be built on new foundations. Post-crisis problems of economic growth imposed new models of regional economic growth on the creators of economic policy. Regional economic growth depends primarily on the level of regional specialization, i.e. on the level of resilience and competitiveness of industrial branches which can be the generators of regional development. The recognition of such branches which stood test of time is a starting point of new regional policy of Serbia.

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