REVIEW ARTICLE
UDK: 330.341.4(497.11)
330.342
330.354:330.322
Date of Receipt: February 5, 2016

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# SMART SPECIALISATION OF MANUFACTURING INDUSTRY: RELYING ON ONE'S OWN STRENGTHS AND TARGETED ATTRACTION OF FDI

## Pametna specijalizacija prerađivačke industrije – oslonac na sopstvene snage i ciljano privlačenje SDI

*'I do not think there is any thrill that can go through the human heart like that felt by the inventor as he sees some creation of the brain unfolding to success... such emotions make a man forget food, sleep, friends, love, everything.'*
*(Nikola Tesla, 1896)*

## Abstract

The manufacturing industry remains the crucial driving force of the total economic growth and development and of the formation of industrial economy. The previous transformation of the economic system did not create new economic structures. The decline in employment is the consequence of the structural adaptation.

The essence of smart specialisation can be found in radical innovations, which are the result of creative combination of technology and the processing sectors. Model RIS3 accelerates entrepreneurial discovery processes.

The state should govern the process of smart specialisation; systematic assumptions for the application of RIS3 model are necessary. RIS3 is a continuous process; it is not just an optimal choice at a certain moment.

Economic messages are directed in a few directions: firstly, the application of RIS3 concept presents a developmental opportunity for Serbia to catch up with other contemporary industrial flows; secondly, fast-growing domestic companies are relying on their own strengths and are the pioneers of a new economic structure (a research on dynamic entrepreneurship has shown that in Serbia there is 1.7% of companies, i.e. 1,551 companies and 270 gazelles, with the growth potential); thirdly, FDI should be targeted - the advantages of FDI are not automatic and they depend on the characteristics of domestic economy, absorption abilities of domestic companies, sectors and on the whole economy. Joining global value chains is a very significant factor of structural transformations.

**Keywords:** *smart specialisation of manufacturing industry, effects of economic transformation, competitiveness of the manufacturing industry, relying on one's own strengths – fast-growing companies, entrepreneurship, targeted attraction of FDI.*

## Sažetak

Prerađivačka industrija ostaje ključna pokretačka sila ukupnog i ekonomskog rasta i razvoja i nastajanja industrijske ekonomije. Dosadašnja transformacija privrednog sistema nije bila u funkciji stvaranja nove privredne strukture. Pad zaposlenosti je posledica strukturnog prilagođavanja.

Suština pametne specijalizacije leži u radikalnim inovacijama, koje su rezultanta kreativne kombinacije tehnologije i prerađivačkih sektora. Model RIS3 ubrzava preduzetničke procese otkrića.

Država treba da upravlja procesom pametne specijalizacije, neophodne su sistemske pretpostavke za primenu modela RIS3. RIS3 je jedan kontinuiran proces, on nije samo optimalan izbor u određeno vreme.

Ekonomske poruke u radu su usmerene u nekoliko pravaca: prvo, primena koncepta RIS3 predstavlja za Srbiju razvojnu šansu da se priključi savremenim industrijskim tokovima; drugo, brzorastuće domaće kompanije predstavljaju oslonac na sopstvene snage i začetnik su nove strukture privrede (istraživanje dinamičkog preduzetništva je pokazalo da u Srbiji posluje 1,7% preduzeća, odnosno, 1551 preduzeće i 270 gazela, sa potencijalom rasta); i treće, SDI treba da budu ciljane – prednosti SDI nisu automatske i zavise od karakteristika domaće privrede, od apsorpcionih mogućnosti domaćih kompanija, sektora i kompletne privrede. Uključivanje u globalne lance vrednosti je veoma bitan faktor strukturnih transformacija.

**Ključne reči:** *pametna specijalizacija prerađivačke industrije, efekti transformacije privrede, industrijska konkurentnost, oslonac na sopstvene snage – brzorastuće kompanije, preduzetništvo, ciljano privlačenje SDI.*

## Introduction

The promotion of the concept of smart specialisation of the manufacturing industry of Serbia is in the focus of this study. The EU concept of smart specialisation RIS3 (Research and Innovation Strategies for Smart Specialisation) is based on investing in crucial national, i.e. regional priorities, challenges and needs for knowledge-based development, comparative advantages and potentials for each country/ region to become excellent, stimulating technological innovations, with the aim of promoting investments in the private sector (Table 1). RIS3 concept is significant for the future of Europe, since the development of economy is based on knowledge and innovations and it remains the biggest challenge for EU. Furthermore, RIS3 is important for achieving sustainable growth, as investments and innovations are necessary for the efficient management of resources. Finally, smart specialisation contributes to well-balanced regional development, the strengthening of territorial cohesion and managing of structural changes, creating economic opportunities, better work places and social innovations.

Apart from the concept of smart specialisation, the study also promotes the research of dynamic entrepreneurship and tests the research results.

## Sustainability of economic growth in the SEE area

Sustainability of economic growth in the SEE is facing ever-increasing risks. Economic disproportions between SEE on one hand, and the EU-15 (the most developed groups of EU states) and the EU-10 (the group of states which joined the EU in 2004), on the other hand, are getting bigger. Transitional countries of the EU-10 group doubled their GDP per capita in the 1990-2016 period, while the average growth of SEE states was 52.7%. The overall weight of economic disproportions in the European area and the depth of economic periphery are illustrated by low standard of living during the transitional period and constant economic gap between SEE and the developed EU states. While at the beginning of the transition in 1990 the economic gap measured as GDP per capita between the EU-15 and SEE was 7:1, in 2000 it increased to 10:1, while in 2008 and 2016 it remained stable at 7:1.

**Table 1: Short SWOT analysis of smart specialisation of the manufacturing industry**

| Strengths | Weaknesses |
|---|---|
| • Varied structure of economic potential<br>• Good R&D potential in the public sector<br>• Educated workforce, with the knowledge of foreign languages and eager to learn<br>• Well-developed Internet access<br>• Well-preserved biodiversity, natural resources and cultural heritage<br>• Gradual raising of consciousness of changes in connection with innovations and structural changes in the economy | • Few domestic powerful industrial systems with a critical mass for innovations<br>• Insufficient budgetary allocations for R&D and innovations<br>• Low level of internationalisation of science and high education<br>• Particular number of inventions is not sufficient for the transfer to innovations<br>• Insufficient connectedness between science and economy<br>• Unused potentials of cultural and creative industry<br>• Weak institutional capacities in the state for the systematic promotion of innovations in entrepreneurship |
| **Threats** | **Opportunities** |
| • Brain drain, especially of young, educated, enterprising and experienced people, both in the economy, and in public administration, with obviously aging population<br>• Capital flight, companies go to other regions and countries<br>• Huge competition in the region in the attraction of foreign investments<br>• Strong centres of knowledge in the region<br>• The risk of infrastructural lagging<br>• Perception of SEE as European outskirts, as an uncompetitive and unrestructured area, with plenty of political turbulences | • Smart specialisation of industry, reorganisation of the international value chains and new industrial policy<br>• Favourable position for well-defined FDI, especially those based on a higher added value<br>• Keeping talented people in the country<br>• Green business operations and materials for the production and energy efficiency<br>• Strengthening of integration instruments at EU level<br>• Programmes for cross-border cooperation with the centres for specialisation and knowledge economy<br>• Visibility in the form of well-preserved nature, cultural heritage, gastronomy, sport, etc.<br>• Traditional presence of Serbian economy on developing markets (South-East Europe, Russia, the Near East, etc). |

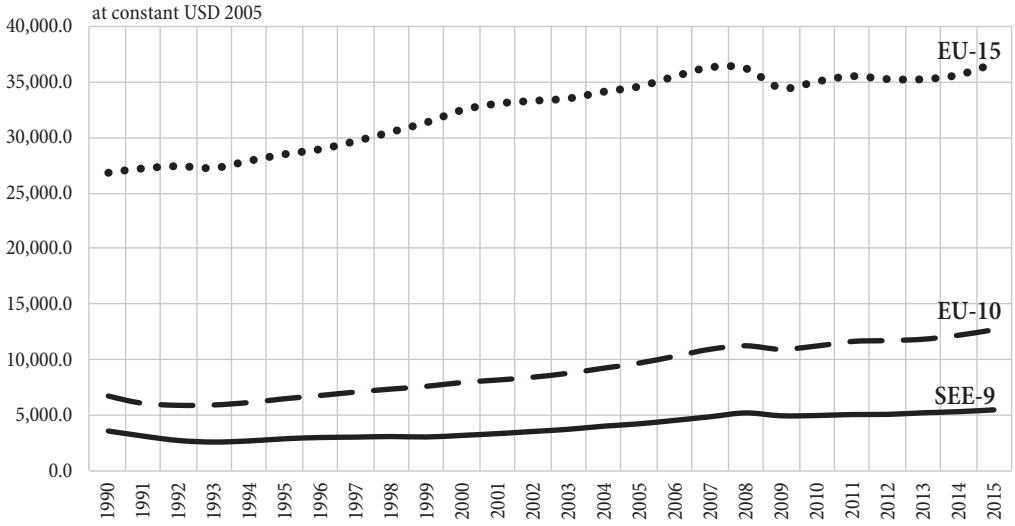
Correspondingly, the gap between the EU-10 and SEE increased (Figure 1), from the initial 1.9:1 (1990), to 2.5:1 (2000); however, it was slightly smaller under the influence of recession 2.3:1 (2016). Regional and social cohesion in Europe is getting weaker, SEE area is increasingly facing various types of poverty and falling behind (the unemployment rate was three times higher). SEE area with more than 53 million people (10% of EU citizens), makes less than 2% GDP of the European Union.

## The effects of transformation

The consequences of the application of the transformation model to the Serbian economy, after a decade of economic distortion and late pre-transitional start, have been manifested not only in structural imbalance and the deformation of the system, but also in all developmental dimensions, from demographic regression to industrial devastation, educational gap, and institutional underdevelopment.

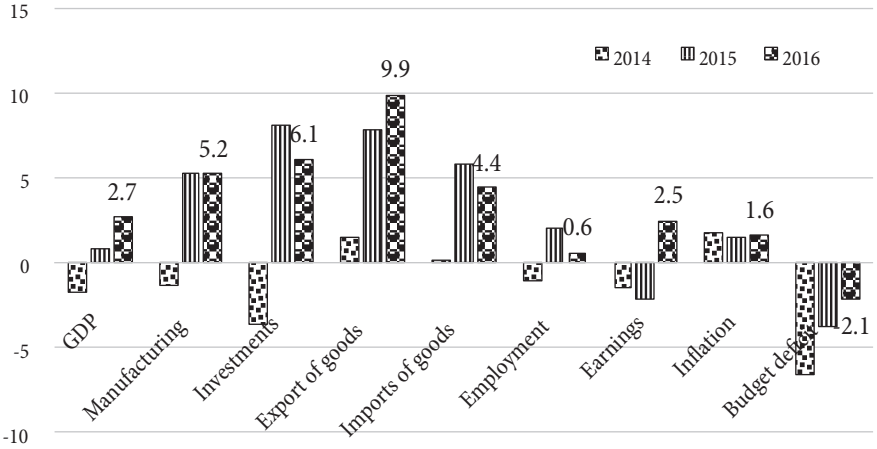
Thanks to the application of the new model of economic growth, which is based on essential structural reforms, in the 2014-2016 period macroeconomic performances of the economy of Serbia have been improved, the recovery of economic activities has been intensified (Figure 2). Consistent implementation of the fiscal consolidation, together with the initiated structural adaptation, has positively affected the investment atmosphere. The industrial production has significantly recovered, while foreign trade exchange has increased. The favourable structure of the initiated recovery has been additionally

**Figure 1: GDP per capita - the growth trend of the economic gap in Europe**




Source: Author's calculations on the basis of the Eurostat.

**Figure 2: The macroeconomic performance of the economy of Serbia 2014-2016 – growth rates**




Source: Author's calculations on the basis of the RSO, MF and NBS.

confirmed by positive labour market trends. Balance of payment deficit has declined, and the targeted inflation is low and stable. The most influential international rating agencies improved the credit rating of Serbia, which sends positive signals to international investors.

Serbia is in the group of the most underdeveloped countries of SEE, and its economic position compared to other countries in the region has not changed. In the countries of the region GDP per capita, as a measure of standard of living, has remained at a similar level as in 2008. According to the size of this indicator, Croatia and Hungary have significantly higher values (around 10,000 EUR per capita, Table 2), whereas other countries have the value from 3,500 EUR to 5,500 EUR (Bosnia and Herzegovina, FYR Macedonia, Albania, Montenegro).

**Table 2: GDP per capita trends**

| | 2001 | 2008 | 2009 | 2014 | 2015 |
|---|---|---|---|---|---|
| Bulgaria | 2,000 | 4,800 | 4,800 | 6,159 | 6,300 |
| Hungary | 5,900 | 10,700 | 9,300 | 11,035 | 11,100 |
| Romania | 2,000 | 6,900 | 5,900 | 8,030 | 8,100 |
| Croatia | 6,000 | 11,200 | 10,500 | 10,434 | 10,400 |
| Serbia | 1,700 | 4,600 | 4,200 | 4,616 | 4,700 |

Source: Eurostat, RSO.

Macroeconomic vulnerability has been greatly affected by the constant growth of foreign debt from 2008. The foreign debt of Serbia was 25.8 billion EU at the end of 2016, and it is the result of high foreign indebtedness. The share of the foreign debt in GDP was about 77% in December 2016.

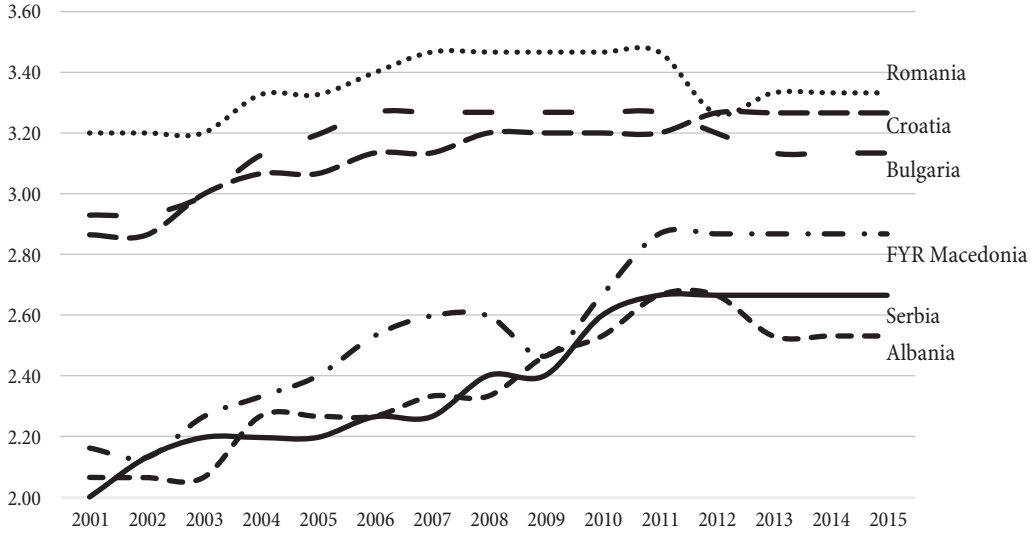
## The speed of reforms

The analysis of experiences with the reforms of successful economies reveals that transitional results depend on both the speed of reforms and the initial position. Generally speaking, economic growth was greater in those transitional economies where reforms were faster than in those which had a strategy of gradual development. The results of the measuring of 'lap time' of the reform activities of transitional countries show that global recession slowed down the reform activities in the whole SEE region in 2015. The reports from EBRD, World Bank, IMF and European Commission show current positive movements and signs of recovery in Serbia in 2015 (Figure 3).

In its "Doing Business List 2016/2017", the World Bank ranked Serbia 47$^{th}$ in the world among 190 countries, which is 12 positions better than in 2015/2016 or, according to the new methodology, improvement by 7 positions (the 54$^{th}$ position in 2015/2016). The progress of Serbia in the "Doing Business List" in a two-year period is huge, since Serbia was on the 91$^{st}$ position in the world.

According to the Report of the World Economic Forum for 2016, Serbia was ranked 90$^{th}$ on the list which comprises 138 countries. In comparison with the previous year, GCI index for Serbia increased by 0.10, which led to positive changes of the position of Serbia on the list by 4 positions (from position 94 to 90 on the list). With its GDP per capita of 5,119.8 USD Serbia is on the 26$^{th}$ place among 30 countries (Phase 2 Efficiency-driven economies).

**Figure 3: Different speed infrastructure reforms – EBRD indicators**




Source: EBRD Transition reports 2001-2016.

## The effects of privatisation

In the 2001-2016 period, more than 2,400 companies were privatised in the Republic of Serbia by means of tender and auction models of privatisation, selling minor share parcels on the capital market, and by means of selling properties and capital, which resulted in the privatisation income of 2.6 billion EUR and contracted investments of 1.0 billion EUR (not including almost 700 cancelled contracts). 1,600 companies were sold by means of tender and auction models of privatisation (2,284 companies before the contract was cancelled), which made an income of 1.8 billion EUR and provided 1.0 billion EUR for investments. Furthermore, minor share parcels were sold from the state portfolio in more than 1,800 companies. The Privatisation Agency, which was responsible for about 4,000 companies in the 2002-2015 period, successfully finished the sale of the state capital in 2/3 of companies, whereas more than 1,000 companies (about 27%) with the state capital went bankrupt.

The effects of privatisation are measured by the level of improvement of basic business performances of a company and the growth of their influence on the economic development. Companies from the Privatisation Agency portfolio privatised (2,414 companies) until May 2016 employed 110,725 employees in 2014, generated 10.1% of income, 10.1% of the profit and 15.7% of the loss of the economy. In comparison with 2002, the share of all observed indicators decreased, and positive tendencies noted in the 2002-2009 period through the growth of the share of these companies in profit gaining (from 15.5% to 17.4%), i.e. a decline in the stated loss of the Republic (from 21.9% to 14.6%), were interrupted during the period of crisis. Privatised companies in 2014 generated 12.3% of accumulated loss (3.3 billion EUR) and 10.8% of liabilities of the economy (7.2 billion EUR). Total liabilities exceeded capital value 1.5 times, while accumulated loss took part in 69.6% of capital (in 2002 – liabilities 70.2%, and accumulated loss 35.4% of the capital value). Due to the influence of the recession and impossibility of fast and efficient adaptation to market conditions, about 300 companies ended in bankruptcy or were removed from the register for active economic entities. On the other hand,

**Table 3: Privatised enterprises – Financial performance indicators, in millions EUR**

| | 2002 | | 2009 | | 2014 | | Real growth/decline in% | |
|---|---|---|---|---|---|---|---|---|
| | The value | % of the economy | The value | % of the economy | The value | % of the economy | 2002-2009 | 2009-2014 |
| No. of employees | 368,976 | 28.2 | 171,133 | 16.0 | 111,725 | 11.5 | -53.6 | -34.7 |
| Fixed assets | 6,552.7 | 18.7 | 7,418.7 | 12.7 | 6,057.4 | 9.5 | -15.8 | -27.9 |
| Capital | 7,289.1 | 19.2 | 6,018.2 | 13.9 | 4,784.4 | 9.6 | -38.6 | -29.8 |
| Total income | 7,351.1 | 20.7 | 9,291.7 | 13.8 | 7,615.8 | 10.1 | -6.0 | -27.6 |
| Profit | 138.6 | 15.5 | 524.92 | 17.4 | 350.2 | 10.1 | 181.5 | -41.1 |
| Loss | 343.3 | 21.9 | 599.8 | 14.6 | 720.7 | 15.7 | 29.9 | 6.1 |
| Liabilities | 5,120.4 | 20.8 | 7,457.2 | 12.7 | 7,235.8 | 10.8 | 8.3 | -14.3 |
| The cumulative loss | 2,576.9 | 20.1 | 1,908.5 | 10.9 | 3,329.7 | 12.3 | -44.9 | 54.1 |

Source: Author's calculations on the basis of the BRA.

**Table 4: The effects of privatisation to foreign buyers**

| | The economy | | | Privatised enterprises | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Domestic buyer | | | Foreign buyer | | |
| | 2014 | Growth/ decline 2002-2009 | Growth/ decline 2009-2014 | 2014 | Growth/ decline 2002-2009 | Growth/ decline 2009-2014 | 2014 | Growth/ decline 2002-2009 | Growth/ decline 2009-2014 |
| Number of employees | 971,171 | -17.9 | -9.4 | 75,600 | -56.5 | -38.2 | 36,125 | -44.2 | -26.0 |
| Fixed assets, mil. EUR | 64,054 | 23.9 | -3.0 | 3,946 | -17.2 | -25.6 | 2,111 | -13.3 | -31.7 |
| Capital, mil. EUR | 49,818 | -15.3 | 1.6 | 3,129 | -36.2 | -31.3 | 1,655 | -42.9 | -26.6 |
| Total income, mil. EUR | 75,628 | 40.6 | -0.8 | 4,108 | -18.2 | -30.8 | 3,507 | 16.3 | -23.5 |
| Profit, mil. EUR | 3,471 | 149.6 | 1.8 | 182 | 225.2 | -42.3 | 167 | 144.3 | -39.7 |
| Loss, mil. EUR | 4,601 | 94.8 | -0.8 | 381 | -4.0 | 6.5 | 339 | 113.9 | 5.7 |
| Liabilities, mil. EUR | 67,301 | 77.0 | 1.5 | 4,702 | 38.1 | -8.5 | 2,533 | -19.0 | -23.4 |
| The cumulative loss, mil. EUR | 27,073 | 1.7 | 36.2 | 2,060 | 8.3 | 47.9 | 1,269 | -70.9 | 65.3 |

Source: author's calculations on the basis of the BRA.

more than 50 companies have been merged, having changed their status, and became a part of successful business systems of connected companies which do business in the country and abroad (Sunoko Sugar Refinery, United Serbian Breweries, Delhaize, etc.).

Briefly, during the transformation period 2001-2016, employment in privatised companies decreased by more than 70%, the capital decreased by 2/3, the loss doubled, liabilities were higher by 50%, accumulated loss by 30%, the total income remained at the same level (Table 3).

The analysis from the aspect of the ownership structure shows that economic-financial performances are slightly better if foreign buyers are involved, rather than domestic. Companies privatised after they had been bought by foreign buyers (176) employ 3.7% of employees, making 4.6% of the total income, 4.8% of the profit and 7.4% of the loss of the economy in 2014 (Table 4).

Comparing the levels of privatised companies one can notice their huge impact on the achieved results: 13.7% of companies employ 1/3 of employees, and make 47.9% of profit and 47.1% of the loss of privatised companies.

In 2014, compared to 2009, activities of companies privatised by foreign capital were fewer by 23.5%, they employed 26.0% employees less, gained smaller profit (-39.7%), while loss was 5.7% higher. However, the rate of change of financial indicators (although negative) is more favourable than the average of privatised companies altogether.

From the regional point of view the greatest number of privatised companies is from the territory of Vojvodina (867; 276 – South-Bačka area) and the City of Belgrade (608). In Šumadija, West, South and East Serbia there are 38% of privatised economic entities doing business (8.0% in Zlatibor and Nišavska region).

Privatised companies from Vojvodina region have the largest share in almost all analysed financial indicators of economy, apart from the loss. The influence of privatised companies on the business operations of the region is the most noticeable in South and East Serbia, where 3.7% of companies (387) employ 17.7% employees and generate about 20% of income, profit and accumulated losses. Financial performances of this region are concentrated in just a few companies.

## The effects of restructuring of large economic systems and PCs (public companies)

In 2015, 310 large companies (0.3% of companies of the economy of Serbia) employed 296,593 workers (29.9% of the economy), generated 43.1% of the income, 37.6% of the profit and 33.3% of the loss of the Serbian economy. Activities of general interest were performed by 485 public companies, which were founded by the Republic of Serbia, autonomous province or local self-government units. In this segment of economy, there were 115,113 workers employed (11.6% of the economy), 6.4% of the income was made and about 6.0% of the profit and loss of non-financial sector (Table 5). The profit grew (24.6% in PCs and 0.8% in large companies) and the loss decreased (-41.3%; -71.9% and -58.3%) compared to 2014, which reflected on profitable business operations of the observed companies – positive net financial result of public companies – 8.3 billion dinars, of large companies 67.8 billion dinars (143.8 billion dinars in the economy).

Large companies, by size, as well as public companies, by the type of organization, are the generators of growth, but they are loss-bearers too, and their business operations have been defining economic trends for years.

**Table 5: Indicators of business of large companies (LCs) and public enterprises (PEs) in 2015**

| Indicators | Participation in the economy (%) | | Growth rates 2015/2014 (%) | | |
|---|---|---|---|---|---|
| | PEs | LCs | The economy | PEs | LCs |
| No. of companies | 0.5 | 0.3 | 0.3 | 4.5 | -5.2 |
| Number of employees | 11.6 | 29.9 | 2.2 | 21.1 | -1.8 |
| Total income | 6.4 | 43.1 | 1.3 | 5.2 | -3.1 |
| Liabilities | 9.9 | 38.7 | 1.1 | 0.1 | -7.1 |
| Net profit | 5.8 | 37.6 | 12.5 | 24.6 | 0.8 |
| Net loss | 5.8 | 33.3 | -41.3 | -71.9 | -58.3 |
| The cumulative loss | 12.0 | 41.8 | 7.4 | 15.6 | -0.02 |

Source: Author's calculations on the basis of the BRA.

Fourteen companies that employ more than 250 employees, and make the fifth of the profit and loss in the Serbian economy (18.5% and 20.5%, respectively) can be singled out as the bearers of economic activities. The oil industry of Serbia, after the privatisation in December 2008, made loss (37.6 billion dinars) just in 2009, and in the 2010-2015 period it continuously made profit (14.6 billion dinars in 2015). The greatest loss-makers are the companies of infrastructural importance (JP Srbijagas, Železnice Srbije [The Railways of Serbia], JP Putevi Srbije [PC The Roads of Serbia]) and companies which have been included in the perennial restructuring (Petrohemija Pančevo, RTB Bor [MTB Bor Mines], Azotara Pančevo [Pancevo Fertilizer Plant], Simpo Vranje).

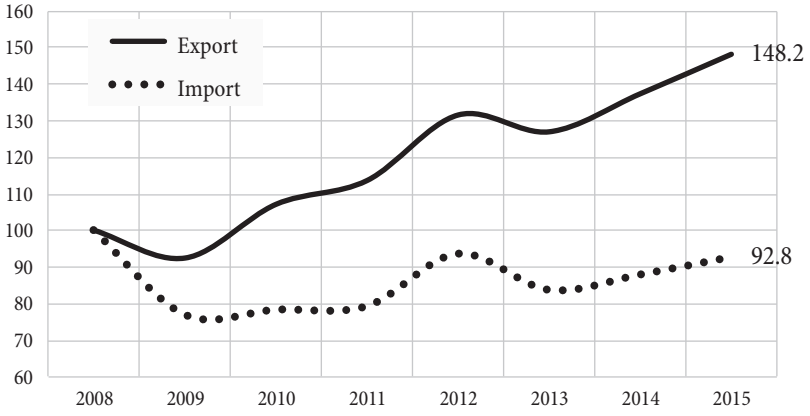
## Industrial, export, technological and factor competitiveness

How big the importance of the manufacturing industry is can be seen in its foreign-trade performances (Table 6). The greatest sector share in the foreign-trade economic exchange in 2015 was the share of the manufacturing industry (61.6%), which achieved 76.8% of the total export, 50.2% of the import and recorded the surplus of 1.2 billion EUR. Large companies dominate in the structure of foreign-trade exchange of the manufacturing industry (64.3%), and particularly in export, where their share is 66.2% (and in import where their share is 62.0%). Positive progress has been noticed in foreign-trade exchange in 2015, surplus was recorded in large companies, as well as in the entrepreneurial sector of 50.3 million EUR.

Import/export ratio of the non-financial sector (Table 6) is constantly increasing (in 2015 it was 74.9%). Although import/export ratio increased in SMEs sector and large companies, it is significantly bigger in large companies (96.2% in 2015) compared to the SMEs sector, where the ratio between import and export was 58.4% (Figure 4).

Better oriented foreign-trade economy is indicated by higher percentage of the total turnover made by export. Constant increase of the export share in the turnover is recorded by large companies and SMEs sector, whereas two times greater value of the coefficient in large companies indicates better export orientation compared to SMEs sector.

**Figure 4: Foreign trade balance of the entrepreneurial sector (2008=100)**




Source: Author's calculations on the basis of the RSO.

**Table 6: Manufacturing – export competitiveness indicators**

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Foreign trade balance, in millions RSD | -643,651 | -483,363 | -520,764 | -546,872 | -641,230 | -458,015 | -488,724 | -483,201 |
| The coverage of imports by exports, % | 48.2 | 53.0 | 58.5 | 60.1 | 60.4 | 72.4 | 72.5 | 74.9 |
| The participation of exporters in the total no. of enterprises, % | 4.4 | 4.0 | 4.0 | 4.1 | 4.2 | 4.4 | 4.3 | 4.5 |
| Participation of importers in the total no. of enterprises, % | 7.6 | 6.6 | 6.3 | 6.3 | 6.6 | 6.8 | 6.5 | 6.6 |
| The share of exports in turnover, % | 8.5 | 8.5 | 10.2 | 10.4 | 11.2 | 13.5 | 14.1 | 15.2 |
| Exports per employee, in thousands RSD | 427.8 | 417.2 | 597.2 | 684.5 | 812.3 | 1,015.1 | 1,098.9 | 1,179.9 |
| Imports per employee, in thousands RSD | 888.0 | 786.7 | 1,021.4 | 1,138.2 | 1,345.7 | 1,401.6 | 1,514.8 | 1,575.9 |

Source: Author's calculations on the basis of the RSO.

**Table 7: The coverage of imports by exports by enterprise size and technological complexity in %**

| | 2008 | | | 2014 | | | 2015 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | SMEs | LCs | Total | SMEs | LCs | Total | SMEs | LCs |
| The economy | 48.2 | 36.5 | 66.1 | 72.5 | 57.0 | 93.2 | 74.9 | 58.4 | 96.2 |
| Manufacturing | 100.1 | 73.9 | 125.8 | 124.3 | 96.3 | 147.0 | 114.5 | 101.7 | 122.4 |
| Low-tech | 98.8 | 105.3 | 91.4 | 136.6 | 136.6 | 136.6 | 140.4 | 139.5 | 141.3 |
| Medium low-tech | 112.4 | 70.3 | 136.6 | 116.3 | 87.0 | 143.1 | 91.5 | 95.7 | 89.3 |
| Medium high-tech | 123.6 | 75.4 | 170.6 | 133.9 | 78.2 | 157.4 | 130.9 | 88.4 | 147.1 |
| High-tech | 29.9 | 14.5 | 81.0 | 56.6 | 27.2 | 130.1 | 57.4 | 26.2 | 110.6 |

Source: Author's calculations on the basis of the RSO.

Relative trade balance[1] of the manufacturing industry in 2015 declined in comparison with the previous year (6.8% compared to 10.8%), and it reveals a slight improvement of industrial competitiveness. The surplus which was made by the commodity exchange of large companies has a significant impact on industrial competitiveness. Entrepreneurial sector of the manufacturing industry made a surplus of 12.3% just in low tech branches, particularly companies in the area of foodstuff production and furniture production. Furthermore, SMEs which do business in the production of basic metals and production of metal products, except machines (medium-low tech), as well as companies from the electrical equipment area (medium-high tech) are export-competitive.

Subsector analysis of the manufacturing industry shows that the positive value of RTB of SMEs sector was recorded just in the following areas: Production of foodstuff products (40.2%), Production of clothing items (12.1%), Production of leather and leather products (20.0%), Wood processing and wood products, except furniture (29.0%), Production of furniture (1.5%), Production of basic metals (34.3%), Production of metal products, except machines (0.5%), Production of electrical equipment (3.5%), Production of machines that are not mentioned above and equipment (15.8%) and Production of other means of transport (24.7%). SMEs sector is the most competitive in high-tech area: Production of computers, electronic and optical products (-58.8%) and Production of basic pharmaceutical products (-53.6%).

Products of low or medium and low technological complexity (62.4%) dominate in foreign trade balance of the manufacturing industry, while the situation is better in SMEs sector, where these products have the share of 72.8% (56.8% in large companies). The situation is similar with the export of the manufacturing industry, where products of lower technological complexity have the share of 62.0% (78.0% of SMEs, 53.8% of large companies).

In spite of positive results in 2015, export competitiveness of SMEs sector is still unsatisfactory. However, indicators of the manufacturing industry have been showing a slight improvement: export/import ratio in technological complexity increased, minimal positive change in structure of export and import according to the intensity factor, but indicators of foreign-trade activity according to SITC, as well as a low coefficient of the restructuring of the export of the manufacturing industry, are still unsatisfactory.

Thanks to the export competitiveness of large companies, the manufacturing industry produces a surplus in foreign-trade exchange. However, the structure of total exchange and particularly of export is not favourable. The growth of Serbian export in the period of transition was not followed by a significant increase of its quality structure (Table 7), it was achieved thanks to the production based on low technology, unqualified work force and significant share of primary raw materials.

Unsatisfactory level of low competitiveness of the Serbian export is displayed in the structure of import according to the intensity factor (Table 8). Products from a lower phase of finalisation and smaller value added (raw materials, labour-intensive and resource-intensive products) dominate in the export of the entrepreneurial sector, which is characteristic for less developed countries. In order for competitiveness to improve, it is necessary to

1 Relative Trade Balance (RTB) stands for the ratio between foreign-trade balance and the volume of foreign-trade exchange, shown in %. Positive value of RTB indicates comparative values (surplus in commodity exchange).

**Table 8: Exports and imports, according to factor intensity 2015 in %**

| Goods | Export | | Import | |
|---|---|---|---|---|
| | SMEs | Total | SMEs | Total |
| A Raw materials (agricultural and primary products) | 39.0 | 30.4 | 17.8 | 26.5 |
| B Labour and resource-intensive products | 18.6 | 14.4 | 13.7 | 11.9 |
| C Professional and low-tech products | 9.2 | 7.6 | 8.0 | 5.8 |
| D Intermediate professional and tech products | 15.6 | 30.7 | 24.1 | 23.9 |
| E Highly professional and tech products | 11.9 | 12.0 | 25.6 | 21.4 |
| Unclassified goods | 5.7 | 4.9 | 10.8 | 10.6 |

Source: Author's calculations on the basis of the RSO.

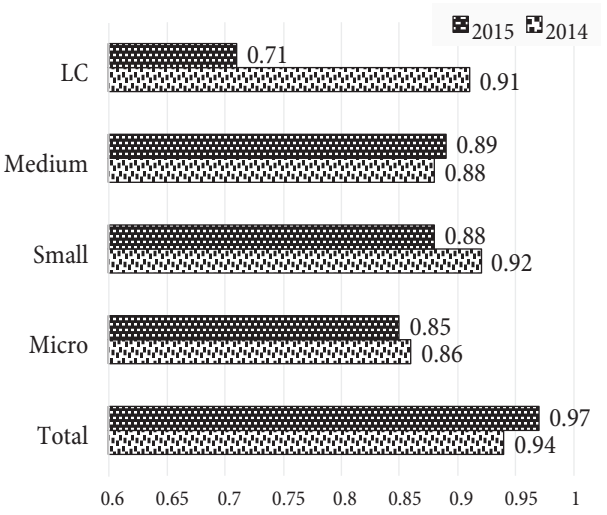
change the structure of export in favour of competitive products (competitive due to their prices and quality) incorporating a higher level of processing (finalisation), which is possible only by investing in modern technologies which lead to the increase of offer, decline in production costs, efficient use of production factors, improvement of product characteristics and growth of export income.

Sector analysis according to SITC rev.4, reveals that the greatest part of export (66.3%) takes place in sectors 0, 6 and 7, while the largest part of import takes place in sectors 5, 6 and 7 (67.0%). Products of these groups have a high export and import, so that their export/import ratio is unfavourable, as well as trade balance. Export/import ratio has significantly increased in food and livestock sector, which at the same time produce surplus in the commodity exchange of tobacco, smoke and animal and vegetable fat. Within SMEs sector, export/import ratio has been recorded in the following commodity groups: food and livestock, raw materials except fuel and animal and vegetable oil. The value of RTB increased in almost all groups of products except the products from group 4. The greatest increase was noticed in groups 1 and 3, which reveals that the strengthening of export competitiveness is most widely spread with products of low technological complexity.

According to the coefficient of export restructuring,[2] SMEs increased the speed of adapting to the market demands compared to the previous period (Figure 5), but they change their export structure more slowly in comparison with large enterprises, which increased their export and range of goods offered to foreign markets by means of restoring and improvement of the production. High value of coefficient indicates slow change of unfavourable structure of export and low import competitiveness of domestic industry and SMEs. Large enterprises adapt their production to the demands of foreign market faster, probably because of larger investments.

More significant economic growth and employment increase in the long run is possible only through the strengthening of export and total competitiveness of the economy, which would enable further strengthening of export growth with the rise in foreign-trade activities. In order to improve export competitiveness of the Serbian products, it is necessary to work on the change of export structure (which is to a great extent based on export of metal – steel, raw materials, a small number of industrial products and food) in favour of technologically more

**Figure 5: Coefficient of restructuring the export manufacturing**




Source: Author's calculations on the basis of the RSO.

2 It is based on Finger-Kreinin Index of structural similarity, used for various structural comparisons of foreign-trade exchange. Coefficient of export restructuring is calculated as the sum of minimum pairs of the share of the same type of export products according to SITC in the years of analysis. Lower value of coefficient indicates faster changes, that is, maximum value 1 means totally identical trade structure in the years of analysis.

complex products of high finalisation, which create higher value added per product unit. The change of export structure should be followed by greater geographical export diversification and strengthening of the positions in current export markets. Strengthening of export competitiveness through the transformation of export structure is possible only via significant growth of business and investment activities of domestic and foreign companies which base their business activities on high technology, knowledge and innovations.

## The concept of smart specialisation - RIS3

The process of accession of Serbia to the European Union emphasises the importance of the necessity of the strategic concept of developmental priorities and models of their realisation, the importance of replacing previous ad hoc solutions with strategic long-term goals. Although economies of small countries such as Serbia are exposed to extreme numerous challenges, this should not be an excuse for the lack of strategic thinking and consensus of political elites on strategic economic goals of economic development of a state.

Strategy of smart specialisation presents a frame for better recognition of the needs of economy by the scientific sector, as well as a connection of research areas with these needs, an efficient transfer of innovations and new technologies into the economic sector, and the creation of conditions for intensifying such cooperation by public policy makers.

The European Commission affirmed the concept of smart specialisation (RIS3) in 2011, in order to help Member States and the EU regions to design their research and innovation for smart specialisation. Smart specialisation (RIS3) is a strategic approach to economic development through a targeted support to research and innovations. The concept involves the process of vision making, identifying economic areas that are of the greatest strategic potential [7, p. 3]. For example, 80% of investments should be channelled through energy efficiency of renewable resources in developed regions, competitiveness of small and medium enterprises and R&D. In less developed regions this goal is 50%.

Facing the loss of competitive position on the global market, European Union started the initiative for developing strategies for smart specialisation, as a new approach to economic development which is based on targeted support to the research and development activities and innovations. The very Member States concentrated on creating new model of economic growth which will increase total competitiveness and decrease inter-regional differences among Member States.

One of the conditions of new EU Cohesion Policy for the programming period 2014 –2020 is that Member States have to identify areas of specialisation that suit their innovation potential the most, with the aim of efficient use of European funds in research areas, technological development and innovations.

The basic concept of smart specialisation is technological specialisation of the economy, above all, through public and private investments in the research, technological development and innovations. The concept is based on the "bottom-up principle", that is, through the cooperation and mutual effort of public, scientific research and business sector, and through the entrepreneurial discovery process one's own strengths and competitive advantages are identified.

The concept of smart specialisation does not present a unified model which is the same for all countries, it is an entrepreneurial process based on making use of one's own capital and innovations, according to a higher value added and activities based on knowledge.

Basic elements of the concept of smart specialisation:

- Prioritisation, investing in key national (regional) priorities as a response to the needs for the knowledge-based development;
- Assessment of one's own strengths, competitive advantages and potentials for excellence in research and development;
- Creating systematic instruments which stimulate technological development and innovations in the private sector;
- Coherence of the whole process within the global context, where territorial specialisation is a part of the global value chain.

Methodologically, the RIS3 concept is based on elements of business strategy [2], [3]. RIS3 is different, depending on the territorial capital; in certain situations, the model of local economy is more efficient than the model of the location economy (sector specialisation); in other situations, it is the model of urbanisation economy (sector diversity), or their combination and balance [9, pp. 685-697]. In the long run, the model of territorially connected diversity is the most optimal [1, pp. 289-311]. In all RIS3 models (Table 9) crucial importance is given to the phenomenon of "entrepreneurial discoveries" [7, p. 5].

The views of the European Commission particularly indicate that in the very application of RIS3 concept, states are focused on a wide scope of activities in order to find the most optimal model of balance between specialisation and diversification. In any case, RIS3 is connected to the territory (a place-based policy), which constantly points out the importance of territorial capital and knowledge specialisation.

The concept of smart specialisation is becoming more and more popular in recent years [5], [6]. Apart from the European Commission, independent academicians and institutions, World Bank and OECD pay special attention to the improvement of the concept [14, pp. 1291-1302].

The concept of RIS3 and Industry 4.0 concept lead to radical changes in economic development and work organisation. Model Industry 4.0 changes basic patterns: the central management of production will be replaced by decentralised processes which are managed, smart products, machines and resources communicate with each other [16, pp. 1-6]. Digitalisation of industry provides the integration of the whole value chain in real time. Industry 4.0 is a real revolution in the area of sustainability and efficiency, whose effects should be connected with RIS3 concept.

## Relying on one's own strengths – fast-growing companies

In each economy the segment of fast-growing companies creates new economic structure; these are companies with the growth potential (dynamic enterprises and gazelles); they use their own resources most efficiently in market environment, they continuously increase employment, improve their balance positions, they react fast on market signals and, accordingly, make fast business decisions. Companies with growth potential, i.e. dynamic entrepreneurs are characterized by: creativity and originality, long-term orientation towards market and buyers, morale and business culture, the ambition of the perennial success and capital profit, the ability to predict a risk and adaptability, as well as a noticeable orientation to problem solving.

## The strengths of the entrepreneurial sector in Serbia

During the transformational 2001-2016 period in Serbia, the sector of small and medium-sized companies and entrepreneurs grew into a significant segment of economy. Although entrepreneurial sector contributes to the GDP of Serbia with just 1/3, other crucial parameters indicate ever increasing share of this sector in the economy: in 2015 entrepreneurial sector (SMEs sector) with about

**Table 9: Main characteristics of entrepreneurial discovery**

| CHARACTERISTICS | CHECKLIST | ASPECTS TO CONSIDER |
|---|---|---|
| Window of opportunity | *Does it have a clear market orientation at international level?* | • *Marketing period at short, medium or long term*<br>• *Geographic scope: national, European and international* |
| Regional helix | *Does the "entrepreneur" arise and /or is supported by the quadruple helix?* | • *Companies*<br>• *R&D and innovation agents*<br>• *Government*<br>• *Users/clients* |
| Technological hybridization | *Are different knowledge/technology domains combined?* | • *Sector-Sector (non technological innovation)*<br>• *Sector-Technology*<br>• *Technology-Technology (technological innovation)* |
| Specialized diversification | *Does it contribute to the diversification of the current regional specialisation pattern?* | • *Incremental improvement*<br>• *New product/service generator of new activities* |

Source: [11].

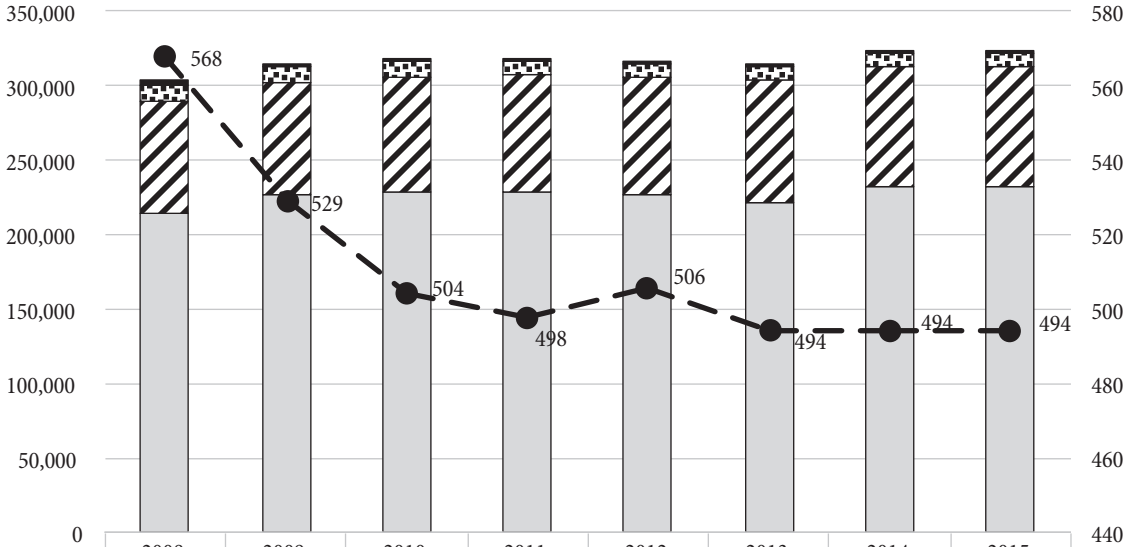
325 thousand companies and entrepreneurs in Serbia (Figure 6), produced 58% of newly created value and 2/3 of the turnover, 44% of export and 57% of import. If we compare it to 2008, which was the year before the crisis, the number of entrepreneurs increased by 21,151, but the number of the employed decreased by 138,440 workers, and newly created value (GVA) declined by 1.2 billion EUR.

The waves of recession particularly hit entrepreneurial sector, not only in Serbia but in whole SEE. Slowed dynamics of recessional recovery of the entrepreneurial sector has a particular weight, since entrepreneurial sector (324,600 of total 325,094) in 2015 retained a high share in forming main indicators of doing business of the non-financial sector of the economy of Serbia. Compared to 2008, in 2015 this segment of non-financial sector recorded lower created gross value added by 16.2%, and employment by 14.7%, which had an influence on reduced productivity of 1.7% (Figure 7). Significantly, during the analysed period, the growth of the net profit was not in accordance with the productivity growth. However, entrepreneurial sector had continuously below-average gross profit (88% in 2008, and 93% in 2015 of the economic average), while profit made by sectors of large companies was continuously higher than the average of the economy (by 24% in 2008, and by 13% in 2015).

Positive trends in recent years illustrate the increase in employment and better foreign-trade performances of this sector. In 2015, the employment rose in micro companies (2.2%), small companies (3.1%), medium-sized companies by 2,561 employees. Business activity increased in medium-sized companies (by 6.6%), entrepreneurs (by 6.5%) and small companies (by 1.4%), while in micro companies' business activity declined by 2.2%. The number of companies in foreign-trade exchange increased – the number of exporters increased by 4.3%, and the number of importers by 1.7%. The trend of the increase of the export/import ratio in SMEs has continued – 58.4% (57.0% in 2014; 55.3% in 2013; 51.3% in 2012; 36.5% in 2008).

The greatest problems are unfavourable sectoral and regional concentration of entrepreneurial sector – dominant influence of unexchangeable sectors (81.8% of companies, 65.4% of employees, 67.1% of turnover and 68.1% GVA of SMEs sector in 2015). The manufacturing industry dominates within exchangeable sectors –15.7%

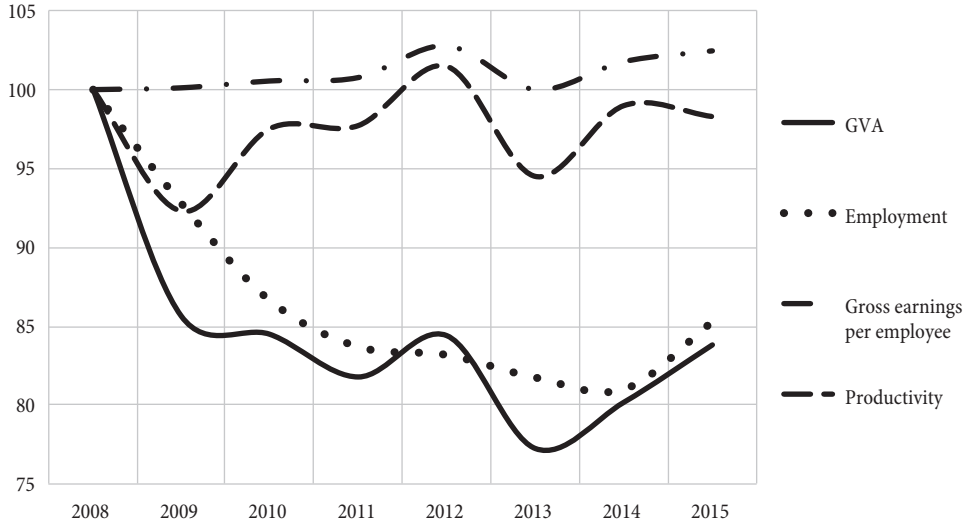
**Figure 6: The structure of the economy by the size of enterprises 2008-2015**




| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Medium | 2,675 | 2,470 | 2,257 | 2,218 | 2,142 | 2,132 | 2,131 | 2,182 |
| Small | 10,415 | 9,873 | 9,614 | 9,656 | 9,699 | 9,353 | 9,198 | 9,531 |
| Micro | 75,540 | 76,243 | 77,989 | 78,890 | 79,189 | 81,775 | 81,327 | 80,122 |
| Entrepreneurs | 214,819 | 226,241 | 228,680 | 228,540 | 226,132 | 222,152 | 231,616 | 232,765 |
| Large | 568 | 529 | 504 | 498 | 506 | 494 | 494 | 494 |

Source: Author's calculations on the basis of the RSO.

**Figure 7: Entrepreneurship in Serbia 2008-2015, basic indicators of business (2008=100)**




Source: Author's calculations on the basis of the RSO.

of companies, 27.9% of the employed, 27.5% of turnover and 25.1% of GVA of the SMEs sector in total.

The concentration of entrepreneurship was the greatest in the most developed region of Belgrade, which in 2015 had a share of 1/3 in number and import, with 1/5 in employment, and with 1/4 in the turnover and GVA and with 14.8% in the export of the non-financial sector. According to GVA per employee, SMEs from the region of Belgrade are two times more productive in comparison with SMEs from the South and East Serbia region, 1.7 times compared to SMEs from Šumadija region and West Serbia, and 1.4 times compared to SMEs from Vojvodina region. Great disproportion in the level of the development of SMEs sector exists at the level of regional areas as well, since the ratio of GDP per person employed in SMEs in the most developed (Belgrade) area and in the least developed (Pčinja) area is 2.3:1, which indicates great unevenness in the achieved level of development area in Serbia.

## Fast-growing companies with the growth potential – structural and regional characteristics

Fast-growing companies with the growth potential are present in all types of economy, both in the period of growth and in the recession period. From state to state, their maximum number is 3-5% of all companies, they have above-average profit and employment growth, they are the bearers of smart specialisation, innovations and sustainable development. These companies should be in the focus of economic policy, they change economic structure and they contribute to the strengthening of economic competitiveness [18].

According to a conducted research of fast-growing companies with the growth potential in the 2010-2015 period, it can be concluded that these companies present a moving force of the growth of domestic economy, being a connection to the developed western market.

The research that was carried out was the third research of that kind in Serbia, conducted according to the same methodology[3]. The first research of the dynamic entrepreneurship was conducted for the 2006-2010 period, and the second for the 2009-2013 period [13].

In the 2010-2015 period in Serbia, 1,551 dynamic enterprises were doing business, out of which 270 gazelles (the most dynamic companies), which endured the recession waves and which presented an economic dam from the implosion of the economic system. The potential for the growth of dynamic enterprises is above average. 1,551 fast-growing companies in Serbia 2010-2015 (Figure 8):

3 The main methodological frame: number of the employed >2 in 2015 compared to the initial 2010; business profit >65,000 EUR (7,850,000 dinars) in 2015; they really made more than three times bigger business profit in 2015 compared to 2010; they recorded profit in 2010 and 2015; social and public companies are excluded; companies from L, O, S, T, U sector are excluded; dependent companies which are a part of an economic whole are excluded.

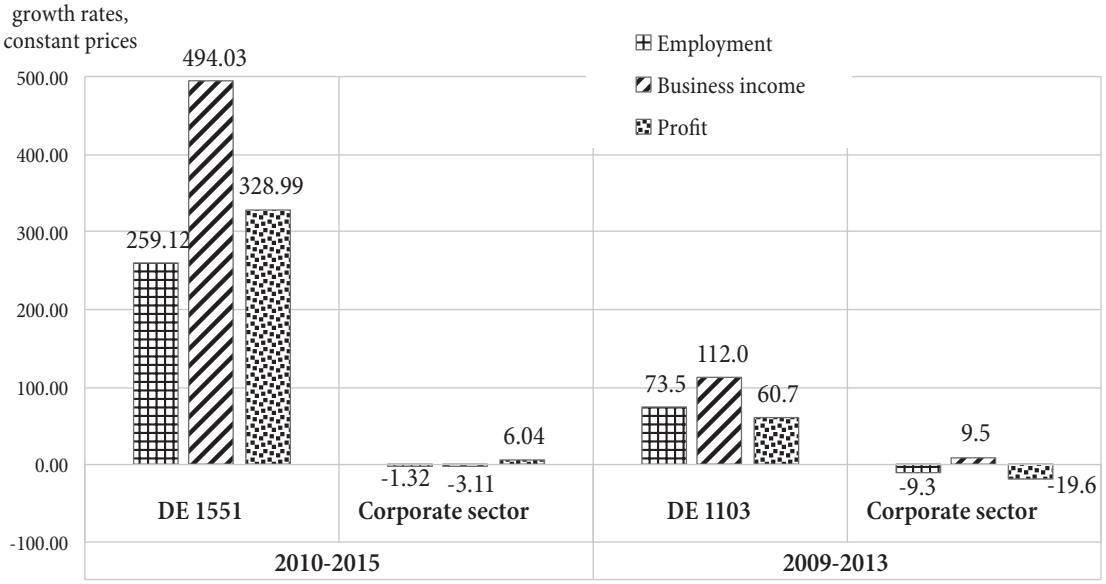
- created 25,000 new work places in the economy (3.56% of total employment in the economy), while in the economy the employment decreased (-1.32%).
- compensated the total decline of the business profit of the economy (-3.11%) with its growth (growth rate 494.03%);
- generated more than 50% of growth in the economy.

Dynamic enterprises increased their contribution to the economic growth in all the dimensions of the research. The increase of the influence of 1,551 fast-growing companies in the 2010-2015 period, in spite of recession waves, is at least three times bigger in all relevant indicators (Table 10):

- The growth of the share of employment from 0.98% to 3.56% (from 9,815 employees to 35,248);
- Growth of the share of the business profit from 0.71% to 4.34%;
- Growth of the profit from 0.99% to 4.02%.

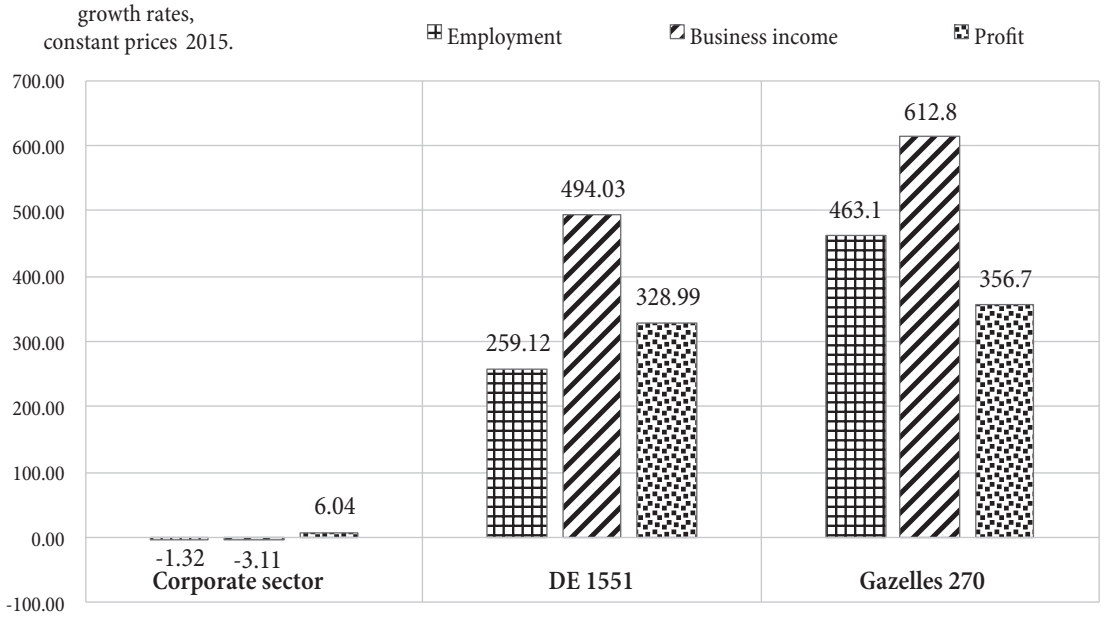
The movement of the share of 270 Serbian gazelles in the economy is much faster than the share of dynamic companies (Figure 9), the greatest contribution is to the reduction of unemployment and to the alleviation of social

**Figure 8: Dynamic enterprises (DE) 2009-2013 and 2010-2015, growth rates**




Source: Author's calculations on the basis of the RSO.

**Figure 9: Dynamic enterprises and gazelles - growth rates**




Source: Author's calculations on the basis of the BRA.

**Table 10: Dynamic enterprises and gazelles, growth of participation in economy (%)**

| | Employment | | Business Income | | Profit | |
|---|---|---|---|---|---|---|
| | 2010 | 2015 | 2010 | 2015 | 2010 | 2015 |
| DE 1551 | 0.98 | 3.56 | 0.71 | 4.34 | 0.99 | 4.02 |
| Gazelles 270 | 0.40 | 2.27 | 0.29 | 2.15 | 0.41 | 1.77 |

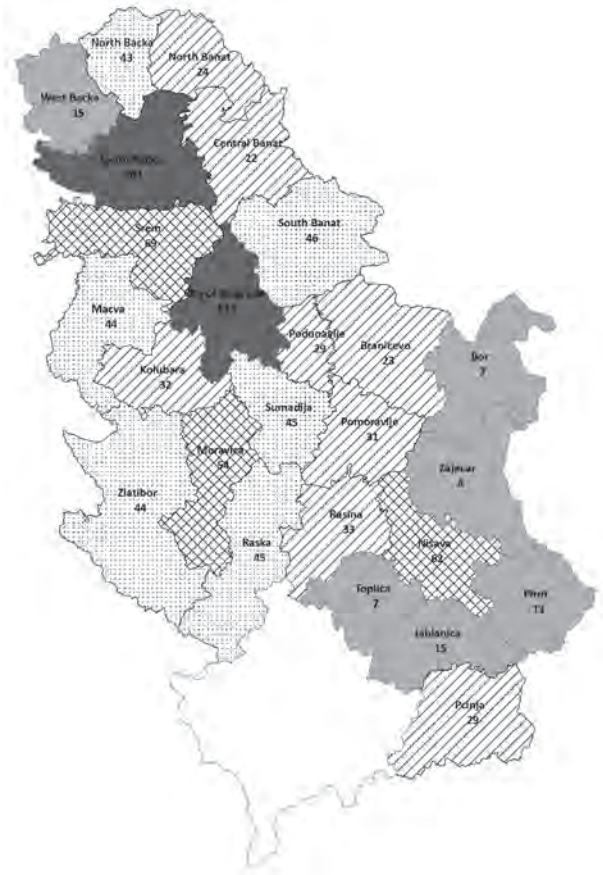
Source: Author's calculations on the basis of the BRA.

tensions (3,984 workers worked in 270 gazelles in 2010, and the growth of 5-6 times was recorded in 2015; 22,433 workers worked in the same gazelles).

Sector structure (Table 11) shows that dynamic companies are concentrated in Trade sector (460 or 30%) and the manufacturing industry (331 companies, or 21%). Positive movements in comparison to the previous research show the growth of dynamic entrepreneurs in sectors: Professional, scientific and technical activities (sector M) and Construction (F).

Regional distribution of dynamic companies and gazelles is in the shadow of economic concentration in the City of Belgrade and South-Bačka area (Figure 10): 841 of 1,551 dynamic companies, 52.5% are concentrated in these two areas. The trend of ever faster economic concentration is shown by other indicators of dynamic companies, 61% of business profit and 60% of total profit was generated in the City of Belgrade and South-Bačka area in 2015. According to the latest research, 53% of Serbian gazelles (143) are located in Belgrade and South-Bačka area.

**Figure 10: The regional distribution DE**




Source: Author's calculations.

## Comparison of results of the three researches

Comparative analysis of the dynamic entrepreneurship of all three researches carried out in Serbia reveals the following (Table 12):

**Table 11: Sectoral structure of DE**

| Sector | Number of companies | Employment | | Business income | | Profit | |
|---|---|---|---|---|---|---|---|
| | | 2009 | 2013 | 2009 | 2013 | 2009 | 2013 |
| A Agriculture | 2.5 | 1.5 | 1.2 | 3.6 | 3.5 | 1.7 | 1.2 |
| B Mining | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 1.1 |
| C Manufacturing | 21.3 | 28.9 | 29.3 | 24.3 | 21.3 | 24.6 | 23.8 |
| D Electrical energy | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.3 |
| E Water supply, etc. | 1.0 | 0.9 | 0.7 | 0.6 | 0.6 | 1.5 | 0.8 |
| F Construction | 10.3 | 11.0 | 7.9 | 11.9 | 10.6 | 13.9 | 13.7 |
| G Trade | 29.7 | 19.5 | 20.4 | 37.6 | 36.0 | 29.9 | 28.6 |
| H Traffic | 12.1 | 7.0 | 6.3 | 6.0 | 5.5 | 5.7 | 5.8 |
| I Accommodation and food services | 2.2 | 1.8 | 2.1 | 1.1 | 0.8 | 1.3 | 1.4 |
| J Information, etc. | 5.8 | 7.2 | 7.4 | 5.2 | 4.1 | 9.0 | 8.6 |
| K Finance and insurance | 0.5 | 0.7 | 0.4 | 0.0 | 0.1 | 3.0 | 1.0 |
| M Professional, scientific act. | 9.6 | 7.5 | 6.0 | 4.8 | 4.7 | 6.0 | 7.9 |
| N Administrative and etc. activities | 3.5 | 4.8 | 9.9 | 1.3 | 1.8 | 2.2 | 1.6 |
| Q Health and social work | 0.3 | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 |

Source: Author's calculations on the basis of the RSO.

- In the first phase of the Serbian economy transformation entrepreneurial sector was developing, creating a significant number of fast-growing companies (2,583), but their potentials were just in the growing and developing phase;
- The second research was conducted in the light of effects of global recession, entrepreneurial sector was more than halved, but these fast-growing companies (1,103) "survived" economic tsunami, became even stronger and more powerful (growth rate of the business profit was more than doubled, and the profit growth rate was even 4 times bigger);
- The last research shows that fast-growing companies (1,551 companies) have become an important economic factor in all segments (business profit has been doubled).

**Table 12: Comparing the results of three studies**

| | Number DE | Employment-growth rates | Business income-growth rates | Profit-growth rates |
|---|---|---|---|---|
| 2006-2010 | 2,583 | 73.45 | 112.04 | 60.66 |
| 2009-2013 | 1,103 | 120.71 | 251.07 | 248.97 |
| 2010-2015 | 1,551 | 259.12 | 494.03 | 328.99 |

Source: Author's calculations.

## Targeted attraction of FDI

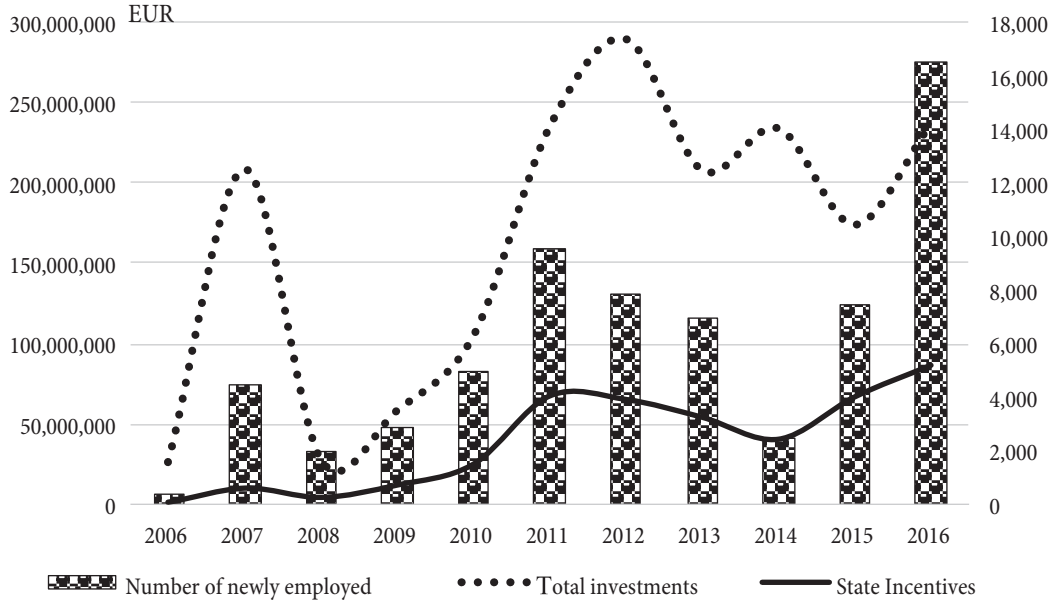
The task of high priority of European industry is the modernization of economy and accelerated introduction of new technologies into the production process. EU strategic documents (Horizon 2020, programmes of technological platforms – Technology Platform/Manufacture and Research Association – EFFRA) point out that only application of new technological solutions in the production could increase value added. New production models connect the production of goods and services with the procurement, as well as the supply chain management, through the connection of various levels of responsibility, from private to public sectors to individual, social and global needs of people. The model of economic growth of Serbia must be based on key enabling technologies (Key Enabling Technologies, KET), on "factories of the future" and digital manufacturing production (Factories of the Future, Digital Manufacturing) which produce high added value, based on knowledge, with the focus on business models, adapted to the requirements of globalized supply chain networks.

The manufacturing sector industries with the greatest comparative advantages and unused developing potential are: food industry – production of foodstuff, production of dairies, production and preservation of meat and products made of meat, processing and preservation of fruit and vegetables, production of beverages, production of bakery products and pasta, production of ready-made food for animals; health industry – production of pharmaceutical products; industry of machines and engines – production of motor vehicles, production of parts and equipment for motor vehicles and engines for them, production of household appliances; ICT – production of computers and peripheral equipment, production of electrical and optical products. Stimulation of smart specialisation of industrial branches implies the development of industrial branches with higher energetic and raw-material efficiency.

Proactive model of the attraction of investments will be based on attracting greenfield investments in the strategic export and high technological economic sectors, which raises competitiveness of the Serbian economy. The strategic approach to attracting investments through the state incentives will be focused on incentives of foreign direct investments which have the production character and which export their products on the wider regional market, and on domestic investments, which are primarily of exporting character. During the 2006-2016 period, state incentives for 217 investment programmes of 433 million EUR provided the total investment of 1,803 million EUR and more than 65 thousand new employees (Figure 11). Apart from attracting greenfield investments, stimulating mechanisms, in case of attracting key enabling technologies (KET), should be directed towards the model of stimulating brownfield investments.

The key comparative parameters of the height of investment in research and development show a significant lagging compared to the states in the region. For example, the investment in research and development was 35.9 EUR per capita in Serbia in 2015, almost 16 times less than the EU-28 average (560.1 EUR per capita) and even 12 times less than in Slovenia (431.9 EUR per capita). Sector structure

**Figure 11: Encouraging direct investments**




Source: Autumn analysis of economic trends, September 2016, Ministry of Economy.

of investment in research and development displays weaknesses of the innovation system of Serbia. Business sector dominates in many countries with the share of more than 50%, while public sector dominates in Serbia (53.5%), whereas business sector has the share of just 8.2%, which is seven times less than the EU-28 average (55.0%), and a few times less compared with our EU neighbouring countries. Unfavourable sector structure of investment in research and development, which is characterised by insufficient investment of private business sector in R&D, and a large share of the public and the sector of higher education presents the biggest weakness of the national innovation system of Serbia. High share of investment in research and development through public sources and system of high education very often implies investment in theoretical and fundamental research which cannot be applied in practice, unlike investments in the business sector, which are mostly oriented to the development of the applied innovations.

## Conclusion

The first condition for the implementation of modernisation of the industry is the dedication of the creators of the industrial policy to that goal. The strategy of smart specialisation accelerates structural changes, transferring from traditional to new sectors, through the modernisation of technology in the existing industries based on knowledge, through the diversification of production lines. New products and services are the result of the synergy of well-created economic processes and new techniques. When they first start doing business, new sectors demand various types of incentives (fiscal, etc.).

The essence of smart specialisation lies in radical innovations which stem from a creative combination of technologies and the processing subsectors. If it is a regional level, region has a high level of specialisation, through RIS3 it creates new jobs and raises employment.

Radical innovations lead to entrepreneurial discovery processes. RIS3 should be able to establish mechanisms for the identification of these radical innovations.

Technology and innovations have the central role in sustainable economic growth and development. Additionally, technological gap presents a developmental trap. Each technological improvement requires greater technological investments.

RIS3 concept is compatible with the concept Industry 4.0, since their goals are complementary:

(a) Promotion of the manufacturing industry and entrepreneurship;

(b) Promotion of education for the production, we need systematic impulses for future education and

the creation of experts on creative and innovative production (the quality of education),

(c) Research and development of innovative products in the manufacturing industry, stimulation of the combination of technological knowledge with entrepreneurship,

(d) Creating new organisation and management model for the global trade, and

(e) Stimulation of accelerating technological transfer and creation of the set of incentive mechanisms.

Serbia needs FDI for many reasons:

- Technological modernisation and international knowledge,
- Relations between foreign investors and suppliers spread vertical knowledge
- Knowledge spillover of local competition through imitation processes and "reverse engineering" (horizontal spillover)
- Knowledge spillover through the mobility of qualified workers, as well as when workers leave their company.

The role of FDI should be neither overvalued nor undervalued. Horizontal "spillover" effect is limited. Sometimes effects on domestic companies can be negative when foreign companies are "more competitive". Mainly, positive effects depend on absorption abilities of domestic companies, sectors and total economy. The advantages of FDI are not automatic and depend on the features of the domestic economy. The stimulation of FDI should be in accordance with RIS3 concept, FDI should be targeted and directed to KET (Key Enabling Technology). Very important factor of structural transformations is the inclusion in global value chains. Apart from the access to the international brands, FDI also have "spillover" effect on the domestic economy.

The development of domestic technological ability presents one of the most important elements of growth. Relying on one's own strengths will depend on fast-growing companies (research 2010-2015 showed that in Serbia there are 1.7% fast-growing companies with the growth potential, out of which there are 270 gazelles, companies with extremely fast growth). These companies present a spring-board towards European competitiveness [12].

The final message of this study is that Serbia must integrate its national planning and industrial policy with international planning and modern European concepts, since this is the way we can get the synergy effect and increase sustainability of economic development.

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