



Munich Personal RePEc Archive

Metal and machine industry in Serbia

Petrović, Dragan and Bukvić, Rajko

Institute of International Politics and Economics, Belgrade, Serbia,
Nizhny Novgorod State University of Engineering and Economics,
Knyaginino, Russia

2018

Online at <https://mpra.ub.uni-muenchen.de/92438/>

MPRA Paper No. 92438, posted 27 Feb 2019 14:50 UTC



18th International Conference
"Research and Development in Mechanical Industry"
RaDMI-2018
13-16 September 2018, Vrnjačka Banja, Serbia

Metal and machine industry in Serbia

Dragan R. Petrović¹, Rajko M. Bukvić²

¹ Institute of International Politics and Economics, Belgrade, Serbia
Email: drdraganpetrovic83@gmail.com

² Nizhny Novgorod State University of Engineering and Economics, Knyaginino, Russia
Email: r.bukvic@mail.ru

Abstract: *The paper analyses status of metal and machine industry in Serbia, with short retrospect to previous period. Also, it presents the short review of the EU policies incentives and subsidies for industry development, especially through European Commission and their concept Horizont-2020. Bad conditions for industry of Serbia in last century quarter are not exceeded, arising trends are questionable. The development conception is not defined and established. Special interest of the paper is the status of the metal and machine industry, as very important branches for the economy of each country.*

Keywords: *industry of Serbia, metal and machine industry, EU concept for industry development*

1. Introduction

Modern macroeconomic theory considers all economic activities as equal, neutral. This obvious microeconomic approach was accepted from macroeconomic theory, with many and far-reaching consequences. This theory forgotten the old economic truth, known more than few centuries: economic activities are qualitatively different. This truth was recognized from the economic life of first European states-cities in early centuries of modern economy's appearance and described in first economic works of Renaissance and mercantilist economists. They emphasized that economic structure of the state is of great importance, and that the industry is moving force of technological progress, an engine to economic growth and creator of synergetic effects in all economy, as was described in 1613 by Italian mercantilist A. Serra [1]. This truth was the cause of the appearance of first economic policy, that was the result of the observations: this, first deliberate large-scale industrial policy was based on an observation of what made the rich areas of Europe rich. To become wealthy, European countries like England and France would have to emulate and copy the economic structures of Venice and Holland, but not necessarily their economic policies. Beginning with Henry VII, the economic policy in European countries in the few next centuries was based on the principle of maximizing the own industrial sectors, while often, at the same time damaging the industry of other countries.

This knowledge was common through the several centuries, until the newest period of predominance market fundamentalism paradigm. Than was finished the era called "the cult of manufacturing industry", that was the main theme in economic policy, if not in economic theory, from the end of the fifteenth century until after the Second World War. Antonio Serra was the

first that emphasized the manufacturing and agriculture are subdued to different principles [1, p. 118–120]. Serra A. was the first to describe increasing returns, named after him “Law of Increasing Returns” (Senior), in contrary to diminishing returns, characterizing agriculture (Turgot).

John Stuart Mill, one of the most influential English economist of the second half of XIX century, apprehend this to be most serious item, to be found in the whole field of political economy. “The question is more important and fundamental than any other; it involves the whole subject of the causes of poverty, in a rich and industrious community: and unless this one matter be thoroughly understood, it is to no purpose proceeding any further in our inquiry.” [2, p. 173]. However, Mill warns, this is not general law: in the case when population increases, the demand for most of the productions of the earth, and particularly for food, increases in a corresponding proportion, while no tendency of a like kind exists with respect to manufactured articles. The tendency is in the contrary direction, but not for all products: it is a probable and usual, but not a necessary, consequence. [3, p. 712–713].

Unfortunately, this alternative economic theory was abandoned in the last quarter of the 20th century. Today, mainstream theory (“standard theory”) is the basis for the economic policy that institutions of Washington required from the underdeveloped countries. But, in general, not required from rich countries. Namely, after the Fall of the Berlin Wall in 1989 and the end of the Cold War, the countries of Eastern and South-Eastern Europe faced a fundamental problem: how to make a transition from planned economy to a market-based one. They created an ambient in which it would be possible to discuss, without prejudice and ideological burden, the role of the State in economic development. The mainstream economic thought, however, hampered proper consideration of two fundamentally different economic outlooks: the production-centered and activist-idealistic (Renaissance) tradition and the barter-centered, passivist-materialistic tradition of Smith, Ricardo and neo-classical economics [4, p. 270].

2. Overview of the Development of Power Industry, Metal Mines and Metallurgy

In many papers, for example [5], it was argued, that this was not the result of the lack of capital, as it state many our authors, but the result of wrong economic policy. We emphasize here the policies that were promoted by Washington consensus, or neoliberal agenda. The implementation of the policy of Washington institutions results in Serbia, among others (primarily, the decrease of GDP), with full deindustrialization (see Fig. 1). Greatest losses, not only in Serbia, were just in industry.

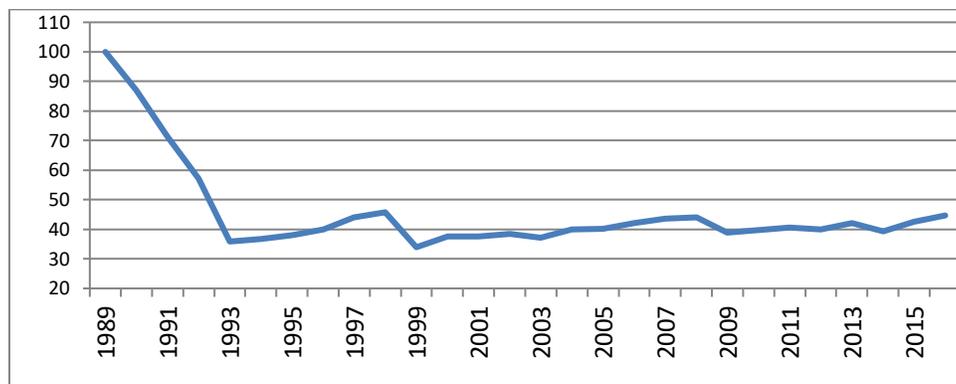


Fig. 1. Industrial output in Serbia (1989=100)

Source: Authors' calculation based on Statistical Yearbook of Serbia 2010; 2012; 2017 [6]

The industrial output in Serbia at the beginning of great financial and economic crisis in 2009 was on the level of 39% related to 1989, many branches drastically decreased output, and some ceased to exist. After that, industrial output oscillated, and only after the increase in the last two analyzed years (by 8.4% in 2015 and by 4.7% in 2016) Serbia has achieved the approximately same level it had in year 1998, before the NATO aggression. It was great drop in 1999, a year in which Serbia (and Montenegro) was bombed by NATO, and many industrial capacities were destroyed. That factor and others during the 1990s (economic sanctions, wars in the surrounding republics) are not to be underestimated. However, a drastic drop of industrial output is clearly seen. The employment rate in industry sector is also catastrophic, having dropped from 700,000 to 400,000 after 2000.

For the beginning of metal and machine industry in Serbia it is taken year 1853, when new built “Topolivnica” in Kragujevac casted successfully its first cannon [7; 8, p. 179]. This was the beginning of the first wave, or primary industrialization of Serbia. During the second half of the 19th century there are grounding of many enterprises of metal and machine industry in at that time Serbia, but also in Vojvodina, that was the part of the Empire of Austria-Hungary. Until the beginning of the World War I, industry in whole, including metal and machine, develops many-sided. Between two world wars, metal and machine industry develops in whole today’s Serbia. Special important centers are Belgrade, Kragujevac, Niš, and many centers in Vojvodina. After the World War II in Serbia happens enlargement of industrial organizations, and creation of industrial zones.

Main subsectors of these activities are: metal processing industry, machinery building, production of transport tools, electric machinery and devices, weapon and munitions.

Metal and electro sector in Serbia achieved economic and technologic maximum in year 1980. After that, it was great deceleration, and after 1985 appeared stagnation and decreasing of production. This status is the result of the sanctions, ineffective privatization and re-organization (restructuring), technological obsolescence, premature liberalization, great share of grey and black economy, instability of currency, with exchange rate primarily directed to utilizing consumption interests, high indebtedness, and at least foreign investments absence, or their bad directions. Metal and electro sectors are always concentrated near great systems, with cooperation clusters. The absence of such systems and cooperators is today huge obstacle to sectors revitalization. Today, metal and machine manufacturing are one of the most important industries in Serbian economy, with share of 6% in its GDP, and with highly qualified employees, educated to achieve European standards.

Enterprises in this industry vary by size and structure, because the same industry is various. The huge companies dominate in the first level of value chain, with great economies of scale (production of basis metals, primarily metal manufacturing), while the companies in processing and production of metal products more specialized belong to small and medium enterprises. In secondary manufacturing, as foundry, pressing, processing and coating of a metal, the share of small and medium enterprises is 90%.

Metal industry was always to export oriented, its share in total Serbian export is 20%. Most important markets are Italy, Germany and Bosnia and Herzegovina. Because of the free trade agreement with Russia, it is the export increase on this market.

3. Metalworking, Power Industry, Metal Mines and Metallurgy of Serbia in the 21st century

3.1. Production

Production of metal and machine industry in Serbia in period 2001–2012 is shown in next table (see Table 1). In basis metal production through 2007 in relation to 2001 was registered more than doubling of physical volume (229.4%), but to 2012 it was registered huge decline and back

nearly to production volume from year 2001 (105%, so only 5% increase for 11 years). In production of other metal products it was registered during period of 2000s constant increase, so index for 2007 in relation to 2001 was 127.5%, and 2012 to 2001 – 150%. In production of electric machinery and equipment index for 2007 in relation to 2001 was 132%, and in 2012 it achieved 146.9%, with continued increase. However, in production of other machineries and equipment, in machine industry, it was registered huge decrease in 2007 in relation to 2001 to only 65.5%, and to 2012 to 57.8%. This means, that the decrease was continued, although considerably decelerated, but total production is almost twice lesser at the end of this 11 years period. Finally, in motor production in 2007 was registered considerable increase in relation to 2001, with index 142.6%, but like basis metals the production decreased until 2012 to only 100.2%. [9, p. 75]

Table 1: Industrial production in the selected branches of the Serbian manufacturing industry, 1980-2012 (physical volume indices, 2001 = 100)

Industry sector	1980	1989	1998	2007	2012
Industry	193	267	121	115.0	103.4
Food industry	118	129	107	127.1	117.7
Production of tobacco products	124	107	98	138.2	124.5
Production of textile yarns and fabrics	195	216	107	42.6	23.5
Production of coke and refined petr. products	128	151	125	152.5	107.5
Production of chemicals and chemical products	68	112	152	248.1	174.9
Production of rubber and plastics	42	50	107	127.0	120.8
Production of other non-metallic minerals	131	152	106	94.7	70.4
Production of base metals	112	125	173	229.4	105.0
Production metal products, except machinery	285	283	125	127.5	150.1
Production of el. machinery and equipment	683	871	130	132.8	146.9
Production of other machinery and equipment	136	161	126	65.5	57.8
Production of motor vehicles and trailers	255	361	126	142.6	100.2
Production of furniture and related products	220	225	100	141.4	83.8

Source: [9, p. 75.]

As we can see, also on the table 3, the financial and economic crisis was crucial, and led to decreasing the main performances of that industry.

According to Chamber of Commerce and Industry of Serbia data [10], number of enterprises in these activities in 2015 was 5,263, with 120,932 employees. Metal and electro industry with 4,747 active enterprises build 5.47% of all enterprises, while it has 103,615 employees, that is 10.48% of all number of employees in the economy of Serbia. Total number of enterprises in metal mines and metallurgy is 516, employees 17,317. The share of metal and electro industry entities in physical volume of industrial output decreased from more than 20%, today it is one half of that. The share of the production of metal ores and metallurgy in physical volume of industrial output varies, because of the oscillations in the production of iron and steel plant in Smederevo.

The export of metal and electro industry for the year 2015 amounted to \$ 4.706 billions, i.e. 10.3% less than in 2014. The import amounted to \$ 6.639 billions, i.e. 4.8% less than in year 2014. The export of metal mines and metallurgy for the year 2015 amounted to \$ 1.34 billions, or 11.4% less than previous year. The import amounted to \$ 1.59 billions, that is 8.8% less than in year 2014.

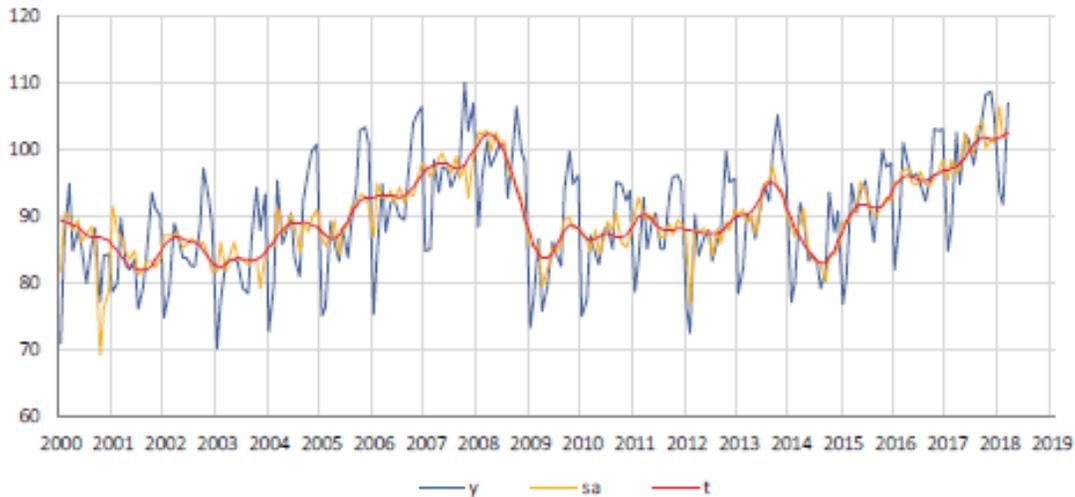


Fig. 2: Indices of production of manufacturing industry of Serbia in 2000–2018
y – original, sa – without seasonal component, t – trend cycle component, Ø 2017 = 100

Source: [11]

During the 25 years of stagnation, it happens enormous technological erosion that destroyed basic competitive abilities of Serbian industry. In this period industrial production decreased in relation to year 1989 for two third, number of employees also decreased for two third, and the share of industry in GDP is at level of one half of that in this year. Two and half decades of crisis status of Serbian economy resulted in the loss of capability to produce high technological products that it produced in 1980s, even in 1970s. In this period many industries and manufacturing branches drastically decreased its production, and some almost disappeared. [8, p. 183–184].

In the text below we discuss growth of metal and machine industry in Serbia, after the financial and economic crisis, i.e. in period 2008–2016.

In general, metal and machine industry shared the faith of Serbian industry. Only food industry and energetics, among the all industries, succeeded to preserve the production level from the period to 1990s. Other branches had great decline.

Table 2: Indices of industrial production by activities, 2008–2016 (Previous year = 100)

Activity	2008	2009	2010	2011	2012	2013	2014	2015	2016
Industry	101.4	87.4	101.2	102.5	97.8	105.5	93.5	108.3	104.7
Manufacturing	101.1	83.9	102.6	99.8	99.1	104.8	98.6	105.3	105.3
Manufacture of basic metals	103.4	71.2	121.1	96.3	53.3	92.2	108.5	120.6	108.8
Manufacture of fabricated metal products, except machinery and equipment	109.8	81.4	107.6	108.8	112.6	105.3	75.3	106.8	107.8
Manufacture of computer, electronic and optical products	97.1	78.8	71.6	124.2	98.0	55.6	108.6	77.8	114.6
Manufacture of electrical equipment	102.3	89.8	111.7	108.5	99.3	111.2	97.6	102.3	109.1
Manufacture of machinery and equipment n.e.c.	120.5	72.9	88.7	109.1	103.8	65.8	129.0	119.1	98.9
Manufacture of motor vehicles, trailers and semi-trailers	84.6	60.2	95.3	124.3	116.5	239.3	97.1	95.4	92.4
Manufacture of other transport equipment	155.2	95.2	84.9	54.5	80.2	66.5	96.7	85.1	152.5

Source: Statistical Yearbook of the Republic of Serbia, Statistical Office, Belgrade, many volumes [6]

Manufacture of basic metals has in 2012 extreme and fast unique decrease, to only about one half of production in previous year (53.3%), next year the decrease in relation to previous year continued, but some less, and in next three years was achieved the progress, but not enough to full

cut back extreme decrease from 2012. Production of fabricated metal products (except machinery and equipment) in every year realized some increase, except in 2009 and 2014, when the declines were huge: about one fifth and one quarter of the production volume. Production of computer, electronic and optical products decreased drastically, almost half of production in previous year in 2013, also considerably in 2009, 2010 and 2015. Production of electrical equipment oscillated during this period, but with not great changes. Manufacturing of machinery and equipment has significant decrease, for about one third of the production in 2013. Previous decrease was also significant, and lasted two years – 2009 and 2010. The recovery in years 2014 and 2015 was again broken in 2016. Production of motor vehicles, trailers and semi-trailers registered increase for 16.5% in year 2012 in relation to previous. In 2013 was registered extreme production increase for about 140%. In next three years it is evident some decrease of the production volume for about 5% per year. Finally, the production of other transport equipment registered constant decrease of production volume during the period 2009–2015, especially pronounced in 2011 and 2013. In 2008 and 2016 it was the increase of production volume, for more than 50%.

3.2. Other performances

Main performances of the metal and electro industry during the period 2006–2010 are shown on table 3. It illustrates the influence of the financial and economic crisis on this Serbian industry.

Table 3: Main performance of the metal and electro industry of Serbia 2006–2010.

Indicators	2006	2007	2008	2009	2010
Revenue realized USD billion	5,1	6,7	6,4	5,3	5,3
Share in total revenues of the Serbian economy (%)	6,3	6,1	6,1	5,7	5,9
Share in total physical volume of the industrial production (%)	9,1	8,7	9,3	9,8	12,5
Company number	4.635	4.793	4.999	5.030	5.044
% of total number of companies	5,70	5,74	5,64	4,84	4,57
Number of employed in the companies	133.828	126.432	128.465	115.224	116.556
% of total number of employed in the companies	11,98	11,35	11,48	10,89	11,70

Source: [10]

Privatization effects were the subject of the analysis in [12, p. 80–82]. Although privatization partly initiated the enterprises restructuring in some fields of manufacturing industry and brought fresh capital, new technologies and new managerial know-how, however, the result thereof was far weaker than the initially expected. In this statistical-economic analysis of the effects of industry privatization in Serbia for non-financial corporate sector in the period 2002–2007, by branches, The authors denoted, that just manufacturing of fabricated metal products had very small effects. So, in period until 2007, privatized firms of this sector achieved weaker labor productivity and unit labor cost in relation to privatized industrial enterprises in branches of fabricated nonmetal products, textile, tobacco, energetics and some other industry branches.

The effects of investments, reform and increase of technological level of modernization of Serbian manufacturing industry by branches in period 2001–2014 were analyzed in [13]. Among the analyzed 8 transition countries (Serbia, Bulgaria, Romania, Hungary, Czech Republic, Poland, Slovenia, Slovakia), Serbia had in period 2000–2013 greatest decrease of employment (–14.3) and GVA (–5.6). Greatest elasticity of growth rates on invested capital among the Serbian manufacturing branches in period 2000–2014 has production of motor vehicles, some above the average production of basis metal products, and about average production of electrical equipment and production of fabricated metal products. Smallest elasticity of growth rates on invested capital has furniture industry, tobacco industry, industry of paper and paper products, and some others. The research results in this work indicate that growth rates were higher in those branches in which reforms were more comprehensive, faster, more intensive and efficiently fully

implemented. In other words, investments, enlargement and modernization of production, implementation of new technologies, result with progress effects, more pronounced just in this branches, among them the manufacturing of metal and machine products. [13, pp. 36–37.]

3.4. Industrial policy in European Union: Some aspects

European Union meets some stagnancy in industry's technological development in relation to some other modern centers of economic power, like China, USA, BRICS countries and many regional economic forces in expansion. Inexpensive labor force, natural resources, less pronounced ecological standards, in many cases expansive growth of population and market, thereafter the economic integrations in these world regions, are some of the most important factors for the growth of the power and technological development of these countries.

After the decades of lost development, with diminishing returns (see [14]), developed countries changed their economic policies. They recognized the role and importance of the factors, mentioned above, and set the innovations on their agenda. In this direction European Union also accepted many documents. After the series of transformations, industrial policy of EU was again innovated in 2014, by the Strategies for Smart Specialization [18], endorsed by the Council of the European Union in December 2013 and adopted by European Commission. In this document the horizontal industrial policy was introduced. Strategies have five goals: 1) they focus policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development; 2) they build on each country/region's strengths, competitive advantages and potential for excellence; 3) they support technological as well as practice-based innovation and aim to stimulate private sector investment; 4) they get stakeholders fully involved and encourage innovation and experimentation; 5) they are evidence-based and include sound monitoring and evaluation systems. The priority for the building of competitive advantages is to encourage "horizontal" regions efforts, innovations creation, research and development, linked to local advantages and predispositions for development of traditional industries, including the metal and machine manufacturing. It is the combination of advanced technologies and local competency of traditional industries, where it should use instruments foreseen to concept development of industry of EU Horizon 2020. For this reason European Commission develops sectors action plans and acts that support the key industrial sectors, including shipbuilding, chemical industry, metal and machine manufacturing, car industry, textile industry, arms industry and some other branches. Special actions are directed to the sectors with geo-strategic implications and high degree of public intervention, like arms industry, some branches of metal and machine industry, energetics, aerospace industry etc. [15, p. 15.]

It is very important that developed countries, first of all Europe, the industrial development always links with technological development [16]. Technological development is the key of industrialization. First step is development of chosen industrial branches, based on the needs of domestic consumption and foreign demand. To achieve designated goals it is necessary more broad social framework, for them it is necessary to carry out reforms of education, labor market, public enterprises, pension system, and comprehensive tax reform.

4. Concluding remarks

Following European Union, Serbia declared itself as the knowledge-based society. In contrary to Europe that in this context industry development set to proper strategic focus, Serbia is in position again to discover role and importance of industry for the development of modern economy and modern society.

The Strategy and Politics of the Industry Development of the Republic of Serbia from 2011 to 2020 [19] estimated that market system and private ownership would be the warrantee for the success of the industry recovery. The progress is expected first of all in that parts of industry that

are high technologic necessitated, and these are among other things manufacturing machine and equipment, production of transport equipment and electronic industry [17, p. 125].

It is clear that Serbia is in huge retardation and stagnancy of almost all industry, including metal and machine manufacturing. The future development concept has to count the possibilities of own support policies at macro level, but on the other side the possibilities of the collaboration with European Union, no matter of real chances to become the member of EU. Independently of that, Serbia has collaboration possibilities, including industry development, with Russia, China and other countries, that are present in our region. China's Silk Road is great development chance for Serbia, that isn't EU and NATO member. This can be its advantage, also when we consider collaboration with Russia (and other, non-western countries). Special trade agreement with Russia isn't enough used.

For the shaping of future industry development in Serbia, especially the development of metal and machine industry, it is necessary to consider the problems and limitations for business in this industry [10]. However, the main problem, specific for this sector, is the need to exceed technological gap, that is the consequence of the disregardful many years relation to production and focusing of the economic policies to consumption. Chamber of Commerce and Industry of Serbia, together with Serbian Academy of Sciences and Arts, works on creation and implementation of the project of National technological platforms of Serbia. Basis for this is proposition, that industrialization is economic imperative and it requires the new development strategy and simultaneous actions of all the society.

The industrial branches in metal and electro industry with good potential for future development are:

- motor vehicle industry, trailers and semi-trailers;
- information technologies;
- electronics;
- electrical equipment in agriculture;
- defense industry.

For the purpose of revitalization of industry of the Republic of Serbia, it is not to disregard the strategic importance of infrastructure energetic and transport sectors, especially railways. We have to remember, the total duration of railways network in Serbia is some more than 3,800 km, and, although passenger railway transport is almost disregarded, height maintenance is necessary condition for the circulation of commodities and raw materials through the territory of Serbia. Railway transport, after waterway transport, is most inexpensive form of cargo transport.

In this sense, interest has to refer on some legal entities from these sectors, that looking only through financial reports can be designated as "enterprises without future". However, in case of bankruptcy and liquidation of these legal entities Serbia loses any control about strategic sectors, not only in sphere of production, but in sector of maintenance and servicing of the existing infrastructure [10].

Among the most important capacities, that are not enough used, we list next few: iron and steel production (to 2,500,000 tons per year); production of hot-rolled flat products (to 1,200,000 tons per year); production of cold-rolled flat products (to 600,000 tons per year); production of tinplate (to 200,000 tons per year), welded pipes and cold formed sections (to 55,000 tons per year); production of drawn wire, production of reinforcing steel (about 250,000 t, with marginal investments to 500,000 t/y), networks and carriers more than 100,000 tons. There are also good possibilities for investments in Mining and Smelting Complex Bor, then in metal mines for the better capacities using and for finalization of ores and concentrates. The capacities in the foundry are not enough used, only 30 to 40 percent [10]. We hope that "Sartid" Smederevo and Mining and Smelting Complex Bor (RTB) solved its main problems, and problems of the Serbian industry, with its new strategic partners.

References

- [1] Serra, Antonio. Kratka rasprava o uzrocima koji mogu izazvati obilje zlata i srebra u kraljevinama u kojima nema rudnika s primjenom na kraljevinu Napulj, S. Štampar (ur.) *Ekonomisti XVII i XVIII stoljeća*, „Kultura“, Zagreb, 1952, pp. 111–188.
- [2] Mill, John Stuart. “*Principles of Political Economy*”. *Books I-II*. Collected Works of John Stuart Mill. Volume 2, University of Toronto Press – Routledge & Kegan Paul, Toronto – London, 1965.
- [3] Mill, John Stuart. *Principles of Political Economy. Books III-IV*. Collected Works of John Stuart Mill. Volume 3, University of Toronto Press – Routledge & Kegan Paul, Toronto – London, 1965.
- [4] Reinert, Erik S. The role of the state in economic growth, “*Journal of Economic Studies*“, Volume 26, 1999, № 4–5, pp. 268–326. ISSN 0144-3585
- [5] Буквић, Рајко М.: Могу ли дознаке постати извор акумулације?, у: Оцић, Часлав (ур.) *Могуће стратегије развоја Србије*, Београд: САНУ, 2014, стр. 357–366. ISBN 978-86-7025-643-9
- [6] *Statistical Yearbook of the Republic of Serbia*, Statistical Office, Belgrade, many volumes.
- [7] Ђокић, Небојша. Почети тополивнице у Крагујевцу, <https://www.mycity-military.com/Stari-srednji-i-novi-vek/Roces-i-Topolivnice-u-Kragujevcu.html> (Date of access: 23 August 2018)
- [8] Петровић, Петар. Четврти талас индустријализације, технолошка димензија и будућност коју не можемо да занемаримо, у: Оцић, Часлав (ур.) *Могуће стратегије развоја Србије*, Београд: САНУ, 2014, стр. 179–211. ISBN 978-86-7025-643-9
- [9] Nikolić, Ivan & Jovan Zubović. Structural Changes in Serbian Industry during Transition, *Industry*, Belgrade, 41, 2013, 2, pp. 67–79. DOI: 10.5937/industrija41-3884
- [10] Metalska, elektro industrija, rudnici metala i metalurgija, <http://www.pks.rs/PrivredaSrbije.aspx?id=12> (Date of access: 25 August 2018)
- [11] *Трендови*, I квартал, Републички завод за статистику, Београд, 2018. ISSN 1820-1148
- [12] Nikolić, Ivan & Miladin Kovačević. The impact of Privatisation – Empirical Analysis and Results in Serbian Industry, *Industry*, Belgrade, 42, 2014, 1, pp. 63–86. DOI: 10.5937/industrija42-4846
- [13] Savić, Ljubodrag; Gorica Bošković, Vladimir Mičić. Structural changes in manufacturing industry at division level: Serbia and new EU member states, *Industry*, Belgrade, 43, 2015, 4, pp. 25–45. DOI: 10.5937/industrija43-8484
- [14] Weisbrot, Mark; Baker Dean, Rosnick David. The Scorecard on Development: 25 Years of Diminished Progress, DESA Working Paper, № 31, 2006. – 18 pp.
- [15] Savić, Ljubodrag i Milena Lutovac, Novi koncept industrijske politike u EU, *Ekonomске идеје и пракса*, Ekonomski fakultet, Beograd, br. 25, jun 2017, str. 7–21. ISSN 2217-6217
- [16] Westkämper, Engelbert. *Towards the Re-Industrialization of Europe . A Concept for Manufacturing for 2030*, Springer-Verlag, Berlin – Heidelberg, 2014. ISBN 978-3-642-38501-8
- [17] Drašković, Božo. Slom industrijskog sektora u Srbiji: postoje li šanse za reindustrijalizaciju. In: *Deindustrijalizacija u Srbiji: mogućnosti revitalizacije industrijskog sektora*, Institut ekonomskih nauka; Beogradska bankarska akademija, Fakultet za bankarstvo, osiguranje i finansije, Beograd, 2014, pp. 107–133. ISBN 978-86-89465-12-9
- [18] *National/Regional Research and Innovation Strategies for Smart Specialisation (RIS3 strategies). Cohesion Policy 2014-2020*, European Commission, 2014.
- [19] Стратегија и политика развоја индустрије Републике Србије од 2011. до 2020. године, „Службени гласник РС“, број 55, 27. јул 2011.