



TRENDS

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TRENDS

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INTRODUCTION

The Statistical Office of the Republic of Serbia, main producer and disseminator of statistics, publishes a large number of releases, indicators, bulletins, etc. A multitude of publications often gives rise to confusion with users who, on the other hand, use data to assess their performances and adapt them to other economic subjects and trends.

As many users, apart from specialists, are statistically and economically illiterate, they may be confused by the diversity of data, unable to understand and prioritize them correctly, which often results in reluctance towards information.

As the statistical system is very complex and generalised, designed to meet the specific sub-sector needs for information, statistical data are often incomprehensible in modern society. Informing the users with „dry“ statistical data is often not sufficient as they provide only a partial picture about macroeconomy. Namely, it has been proved that traditional concepts of data (tables, statistical releases, etc.) do not facilitate quick understanding of the socio-economic reality and fail to transmit the key message, particularly when there is a large amount of data.

Having in mind all the above and following world trends in presenting statistical data, as well as the interest shown by professionals, the redesigned *Trends* traditionally provide quarterly and annual data, but also use new concepts of presenting the most important economic signals via modern and advanced graphical solutions for presenting and dissemination.

The issue for the second quarter of 2023 presents a review of major economic trends in this period and in the whole year: Gross domestic product, Industrial production, Construction, External trade, Domestic trade, Prices, Labour market, Salaries and Wages, Tourism, Economic Sentiment Indicator, Regional economic asymmetries and Agriculture.

As always, this issue presents also the forecasts of trends in certain areas in the next period, obtained under ARIMA forecasting models (in the following sections: Industry, Domestic trade and External trade). A set of composite leading indicators, which can anticipate with high reliability the cyclical movements, and serve short-term forecasts, is presented in the section Macroeconomic forecasts.

The topics of the two papers in this issue of *Trends* are: Labour productivity as the parameter of growth of manufacturing (written by Svetlana Jelic, Vladimir Sutic and Ana Cakic) and Modern flow of the demographic transition in the Republic of Serbia (written by: Jasmina Jotev).

Since 1999, the Statistical Office of the Republic of Serbia has no available data for AP Kosovo and Metohia, therefore they are not included in the data for the Republic of Serbia (total).



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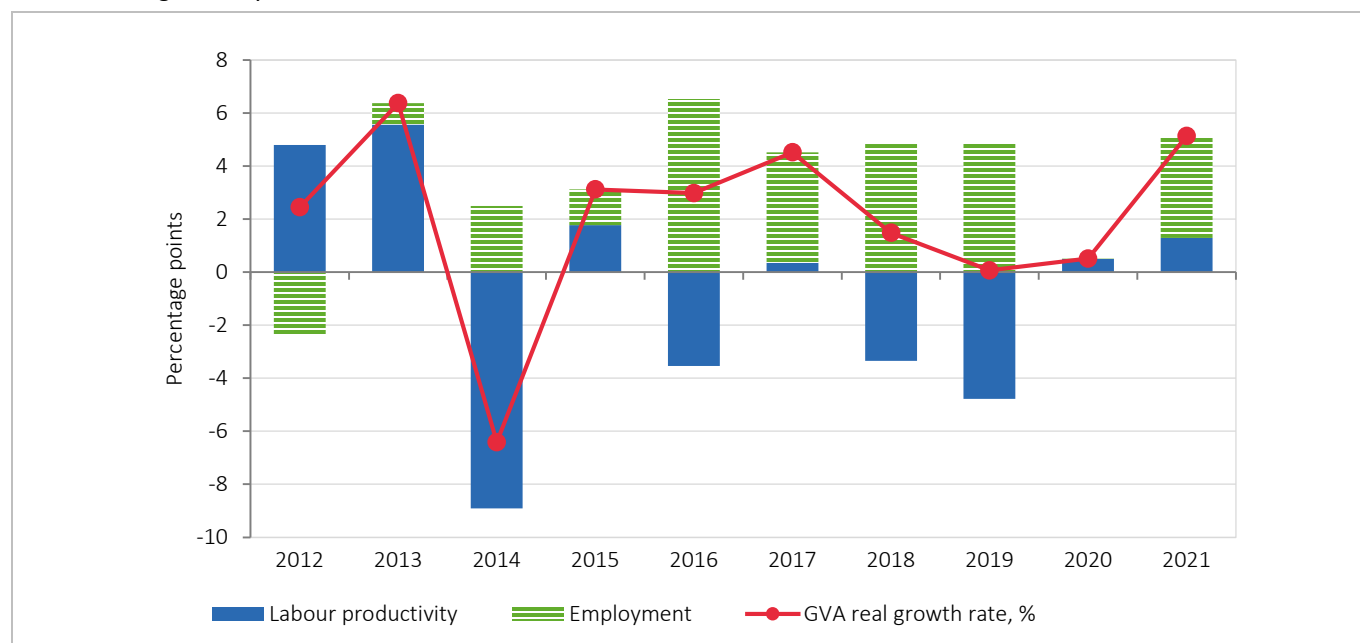
LABOUR PRODUCTIVITY AS A PARAMETER OF THE GROWTH OF MANUFACTURING IN SERBIA

In modern market competition manufacturing business operations have been continuously valued existentially, so that for the establishment of a prosperous and long-term sustainable growth and development the emphasis is put on productivity, that is the efficiency of the used productive potentials, as a fundamental economic topic. All changes in the realised steps of the newly-created value are at least the result of the variations in the volume and efficiency of two inputs of engagement in the process of production – labour force and fixed capital.

GROWTH OF MANUFACTURING SERVING LABOUR PRODUCTIVITY AND EMPLOYMENT

If the focus is on the labour force, as the factor of growth in manufacturing, from the viewpoint of stability and business operations sustainability it is necessary to take into account two aspects of this resource – quantitative and qualitative. Basically, this implies that increased productivity can be achieved by a larger number of employees working at a given technical and technological level of production, that is by a stronger intensity of labour, but also by higher productivity, that is by raising the value added per employee, extending the volume of fixed capital per unit of work or/and by raising the overall level of the technical progress in manufacturing. It is after having eliminated numerous socio-economic aspects of labour force engagement and having brought into focus only the segments that are likely to be quantified through direct influence on GDP growth that it is possible to recognize and delineate, from the perspective of economic performance, the quantitative and qualitative contribution of labour input in creating the gross value added (GVA) in the section Manufacturing (diagram 1).

Diagram 1. Direct contribution of the dynamics of employment and labour productivity to the real GVA growth in manufacturing industry



When looking at the modalities of labour input performance, in the last decade two periods in domestic manufacturing are identified: 2012–2015 and 2016–2021. Namely, as a result of a stronger orientation towards growth and development (inter alia, investment impetus in the automobile industry¹, which resulted in strong growth in 2013) and intensified productivity in the section Manufacturing, in 2012 and 2013 the production of GVA expanded, which however was not followed by a corresponding growth in the subsequent years. While at the beginning of the observed ten-year interval productivity dynamic was the main generator of economic activity acceleration, then in the second identified period its influence changed the course of direction, so that it reduced the growth of the section in certain years by its negative performance. For example, in 2019 the levels of employment and productivity rates were approximately the same, but with an opposite sign (4.8% and -4.6% respectively), which brought the changed realised gross value added almost to zero (0.1%). The favourable effects of dynamic employment were almost neutralized by a sharp decline in labour productivity. As a result of the measures of active economic policies, a series of positive values of the gross value added was realised over the period 2016-2021, but with the quantitative component exceeding considerably the qualitative one by its contribution to the growth. The chart shows that productivity stagnation was compensated by labour intensity, that is the growth was dominantly supported by the changes in the quantity of input (on average, the number of employed workers was up annually by 4%), without a qualitative leap in efficiency (year-on-year decrease in productivity by 1.5%, table 1).

Interpreting the diagram facilitates drawing a certain general conclusion: in all the years where increasing labour productivity was recorded, the GVA growth rates of manufacturing were more dynamic in relation to the previous year (and vice versa, labour productivity fall inevitably led to a weaker rhythm of economic results compared with the previous year), which was not the case with employment. In fact, **it is empirically confirmed that the passage of the productivity indicator in the zone of negative values indicates that the sectoral dynamic tends to slow down even though the labour force is more intensively engaged in the production process. The mechanism that compensates for smaller efficiency by extensive development, that is by increasing the employment rate, has limited effect and is relatively quickly exhausted so that the productivity rate is at least the only adequate parameter for measuring business performance.** Having in mind the economic principles of business, the optimum would be to establish an ascending trajectory of the value added based on the synergistic increase of both components - productivity and number of workers employed (recorded in 2013 and 2015, with a predominant productivity performance), which requires an extension and modernisation of production capacities.

LABOUR PRODUCTIVITY OF THE SECTION MANUFACTURING IN THE CONTEXT OF THE TOTAL DOMESTIC ECONOMY

In the context of the process registered in the total economy, in the last decade there were certain opposite movements of manufacturing productivity in the two cited intervals, 2012–2015 and 2016–2021. Namely, while the industry at the beginning of the decade, due to the investment impulse of certain large enterprises, was growing intensively with a rise of labour productivity (2.8% cumulatively), the rest of the economy had negative efficiency performances, so that the cumulative productivity rate of the total economy was below zero (-4.3%), even though the results of production were overall positive (GVA increase of 3.4%, table 1). The situation was completely opposite as far as qualitative growth indicators in the second part of the observed period are concerned – manufacturing saw a negative and total economy an increasing cumulative productivity rate (-8.8% and 5.8%, respectively).

The comparative review of the relevant productivity parameters in manufacturing and the total domestic economy is shown through adequate real growth rates in the tabular presentation below.

¹ A strong change towards the recovery of the investment activity in the country was made by intensifying investments, primarily in the company Fiat in 2012, which raised significantly the level of real investments not only in industry but also in total economy. However, the mentioned expansion did not maintain in the following period due to the lack of accompanying economic measures and clearly profiled development strategy. In fact, considering the general circumstances in the economic environment itself, the investment impulse was not felt in other business spheres and was stopped in 2013 by a drastic fall (the fall in industry by even 8.3 p.p. was higher than in 2009, year of crisis), making the real level of investments to drop under the achieved one in the period prior to the crisis.

Table 1. Comparative review of the indicators of labour productivity in manufacturing and total economy
real growth rates, %

	Manufacturing			Total economy		
	Labour productivity	Number of employees ¹	GVA	Labour productivity	Number of employees ¹	GVA
2012	4.9	-2.3	2.4	0.5	-1.1	-0.6
2013	5.5	0.8	6.4	0.0	3.7	3.7
2014	-8.7	2.5	-6.4	-6.4	4.8	-1.9
2015	1.7	1.3	3.1	1.7	0.6	2.3
2016	-3.3	6.5	3.0	-2.5	5.6	2.9
2017	0.3	4.2	4.5	-0.7	2.8	2.1
2018	-3.2	4.8	1.5	2.9	1.4	4.3
2019	-4.6	4.8	0.1	1.9	2.4	4.4
2020	0.5	0.0	0.5	-0.4	-0.2	-0.6
2021	1.2	3.8	5.1	4.7	2.6	7.4
Cumulative rates ²						
2012–2015	2.8	2.2	5.2	-4.3	8.1	3.4
2016–2021	-8.8	26.6	15.5	5.8	15.4	22.1
2012–2021	-6.2	29.5	21.4	1.2	24.7	26.2
Average year-on-year rates						
2012–2015	0.7	0.6	1.3	-1.1	2.0	0.8
2016–2021	-1.5	4.0	2.4	0.9	2.4	3.4
2012–2021	-0.6	2.6	2.0	0.1	2.2	2.4

¹ The number of employees is obtained from the National Accounts calculation.

² When calculating the cumulative changes over 2012–2015, the data from 2015 were observed in relation to 2011, and for the period 2016–2021, the data from 2021 were observed in relation to 2015.

The positive dynamics of the newly-created value over 2016–2021 were followed by favourable movements in the labour market (except in 2020, when business conditions were impeded by the coronavirus pandemic), with an average annual growth of the number of workers employed at the level of total economy of 2.4% and **with very intensive employment in the section Manufacturing by the average annual rate of 4.0% (the cumulative employment growth in manufacturing was twice bigger in the observed period in relation to the same indicator at the level of total economy, 26.6% versus 15.4%)**. At the same time, while the productivity of an engaged labour force in the national economy (measured by the value added per unit of work) in the observed interval registered an average growth of 0.9%, the value of the equivalent indicator in manufacturing was below zero (-1.5%). Having in mind that the labour productivity of manufacturing was below the average of the domestic economy (on average, by about 8% over 2016–2021), such tendencies caused a completely justified reservation regarding the perspective of the medium-term development of the mentioned section.

The response to such a state can be partly found in the expansive employment policy, the latter being particularly active in labour intensive activities, where the performance of the labour force and the number of highly qualified workers employed are generally low. This did not however contribute enough and adequately to the creation of highly qualified jobs.² In the short term, standard labour market functioning gave way to the effect of economic measures, so that the employment dynamic absorbed all other factors of efficiency. Establishing balance in the circumstances of increased employment showed through negative values of labour productivity in manufacturing at the rates of 3.3%, 3.2% and 4.6% in 2016, 2018 and 2019, respectively. Namely, the growth of the number of workers employed in manufacturing (on average, 4.0% annually over 2016–2021) was more dynamic by 1.6 percentage points than the trends of production of the value added, which became evident through decreased section productivity of, on average, 1.5% annually. In contrast, in the same interval the growth of total economy GVA (3.4%) exceeded by one percentage point the employment dynamic (2.4%), which resulted in a larger productivity of 0.9%. However, in the last two years (in 2020 and 2021) the GVA dynamic in manufacturing was also above the employment rate, by 0.5 p.p. and 1.3 p.p., which raised the level of productivity by 0.5% and 1.2%, respectively. While the rest of the economy was burdened by a series of negative indicators in the year of the coronavirus pandemic (2020), manufacturing succeeded, in terms of its efficient output, in resisting the extraordinary circumstances of the crisis.

Nevertheless, throughout the whole time interval 2012–2021, manufacturing recorded a negative year-on-year labour productivity rate of -0.6%, despite the analogue GVA growth of 2.0% and increase in the number of employees at a rate above the average for the entire economy (2.6% versus 2.2%). For the same period, the total economy, even besides the negative tendencies from the first part of the observed period (-1.1% year-on-year fall of productivity), realised a positive productivity rate of 0.1%. Practically smaller labour efficiency in manufacturing was partly caused by the extraordinary increase in their volume (cumulatively growth of the number of workers employed of 29.5%), compensated by affirmative qualitative tendencies in the rest of the economy.

However, even though the values of certain qualitative economic parameters in the section Manufacturing decreased, the application of the measures of the economic policy (primarily subsidies for opening new jobs, or also subsidies for attracting SDI, etc.) was expected to bring benefits to the domestic economy when looking broader socio-economic context. Complex socio-economic conditions dictate the pace of development processes implementation, which needs to be taken into consideration in order to have a coherent progress of society as a whole.

RANKING OF THE DIVISION MANUFACTURING ACCORDING TO PRODUCTIVITY AND EMPLOYMENT

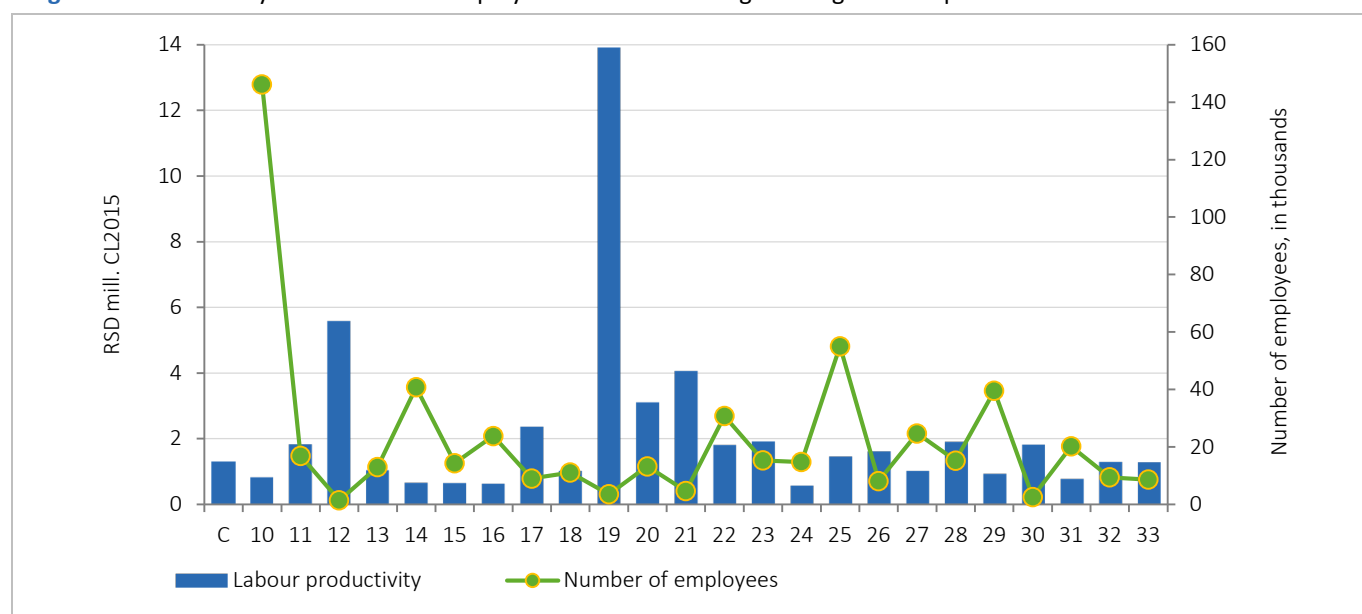
Knowing that manufacturing is a very heterogeneous economic segment with often completely independent divergent economic processes in its integral parts, it is possible to examine the causes of unfavourable summary indicators of productivity by bringing the analysis of input down to lower levels of activity. As the performances of certain industrial divisions are the first to be taken to assess the potential of the section in terms of increasing labour productivity, the chart with two value scales depicts the distribution of the number and productivity of employees³ (diagram 2).

² As far as Serbia is concerned a considerable limiting factor in terms of productivity growth for the whole economy, beside the mentioned one, is also a bad efficiency of public enterprises and chronic “loss-makers” that impacted negatively the growth of GDP and productivity with their losses and surplus of labour force throughout the entire period. Also, when it comes to manufacturing, it is necessary to reform the remaining public companies that exist in this section and generate negative value added, thus nominally decreasing the total sectoral output and productivity parameters.

³ Average real values of GVA production per employee on annual level were given in chained measures of volume at 2015 prices (mill. RSD CL2015) in order to be able to make a comparable analysis of data in the observed six-year period. The chaining method (in this case with 2015 as the reference year) is applied for obtaining series of comparable data because real values of the gross value added obtained by deflating current prices are not comparable by years (by calculation, every year is valued by the prices of the previous year).

The number of workers employed was obtained from the National Accounts calculation.

Diagram 2. Productivity and number of employees in manufacturing - average for the period 2016–2021¹



¹ The diagram presents the codes of the Classification of Activities (CA 1010) for the corresponding economic divisions of the section Manufacturing:

10 Manufacture of food products	22 Manufacture of rubber and plastic products
11 Manufacture of food beverages	23 Manufacture of other non-metallic mineral products
12 Manufacture of tobacco products	24 Manufacture of basic metals
13 Manufacture of textiles	25 Manufacture of fabricated metal products, except machinery and equipment
14 Manufacture of wearing apparel	26 Manufacture of computer, electronic and optical products
15 Manufacture of leather and related products	27 Manufacture of electrical equipment
16 Manufacture of wood and products of wood and cork, excluding furniture	28 Manufacture of machinery and equipment n.e.c.
17 Manufacture of paper and paper products	29 Manufacture of motor vehicles, trailers and semi-trailers
18 Printing and reproduction of recorded media	30 Manufacture of other transport equipment
19 Manufacture of coke and refined petroleum products	31 Manufacture of furniture
20 Manufacture of chemicals and chemical products	32 Other manufacturing
21 Manufacture of basic pharmaceutical products and pharmaceutical preparations	33 Repair and installation of machinery and equipment

In domestic manufacturing over 2016–2021, considerably above the others by productivity (measured by realised GVA per worker), the divisions that stand out are *manufacturing of coke and refined petroleum products*, then *tobacco, pharmaceutical and chemical industries*. However, the chart shows that these quarterly intensive divisions engage mainly a small number of workers in their production process. It reveals that labour is the least productive in labour intensive branches, such as the *wood industry, leather industry, wearing apparel industry*, but also in the *food industry*, the latter being much above the other divisions by the number of workers employed (the annual average in the observed period is 146,2 thousand), but far under the average of the section by their productivity. Moreover, taking into account its relative importance (it accounts for 26.9% of the total number of workers employed in manufacturing, table 2), this division is considerably bringing down, by its business performance, the average of the section, as far as qualitative business qualitative parameters are concerned. From the viewpoint of total results of the efficiency of manufacturing, it is obvious that the significant effectiveness of the workers in highly productive activities cannot replace their modest number, i.e. these activities do not employ enough workers so that they can be the main drive force of industry in terms of productivity.

Knowing that the level of productivity is the key indicator of economic growth and development, the following table shows, according to these criteria, the economic divisions positioned in domestic manufacturing (table 2). In addition, the qualitative and quantitative characteristics of labour efficiency are presented with detailed information on the amount, features, structure and distribution of productivity among the economic activities of the section, in the context of the business performance of the total economy.

Table 2. Performance of labour productivity in manufacturing in the Republic of Serbia
average for the period 2016–2021

CA2010		Labour productivity		Employment		Share in the Manufacturing industry, %	
		Rank	RSD thous. CL2015 ¹	Rank	Number of employees ¹	In GVA	In employees
Total economy		-	1398	-	2861239	-	-
Manufacturing		-	1283	-	542489	100	100
Divisions with productivity above the average of the total economy							
19	Manufacture of coke and refined petroleum products	1	13896	22	3531	7.2	0.7
12	Manufacture of tobacco products	2	5591	24	1421	1.4	0.3
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	3	4077	21	4650	2.5	0.9
20	Manufacture of chemicals and chemical products	4	3123	14	13277	5.8	2.4
17	Manufacture of paper and paper products	5	2380	18	9037	3.2	1.7
23	Manufacture of other non-metallic mineral products	6	1932	10	15300	4.3	2.8
28	Manufacture of machinery and equipment n.e.c.	7	1927	11	15270	4.2	2.8
11	Manufacture of beverages	8	1844	9	16949	4.0	3.1
30	Manufacture of other transport equipment	9	1838	23	2564	0.7	0.5
22	Manufacture of rubber and plastic products	10	1827	5	30780	8.3	5.7
26	Manufacture of computer, electronic and optical products	11	1633	20	8118	2.2	1.5
25	Manufacture of metal products, excluding machinery and devices	12	1482	2	55054	12.1	10.1
Divisions with productivity under the average of the total economy							
32	Other manufacturing	13	1316	17	9439	1.8	1.7
33	Repair and installation of machinery and equipment	14	1306	19	8615	1.7	1.6
13	Manufacture of textile	15	1056	15	13031	1.8	2.4
18	Printing and recording of recorded media	16	1043	16	11106	1.3	2.0
27	Manufacture of electrical equipment	17	1041	6	24708	3.6	4.6
29	Manufacture of motor vehicles, trailers and semi-trailers	18	953	4	39521	4.8	7.3
10	Manufacture of food products	19	847	1	146157	18.3	26.9
31	Manufacture of furniture	20	802	8	20229	2.3	3.7
14	Manufacture of wearing apparel	21	678	3	40753	3.7	7.5
15	Manufacture of leather and related products	22	667	13	14387	1.3	2.7
16	Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	23	654	7	23843	2.2	4.4
24	Manufacture of basic metals	24	591	12	14749	1.2	2.7

¹ See the explanations in footnote number 3 on page 10.

As every activity is specific by itself, the relationships between the numbers and employees' productivity vary in the economic structure of manufacturing. The divisions of manufacturing are often being ranked the other way around according to the values of two variables, i.e. it is most frequent that the divisions with fewer employees have higher productivity and vice versa. The division *Manufacture of coke and refined petroleum products* is much more productive than the other divisions (10.8 times above the section average and 9.9. times above the average of the total economy), and is ranked 22nd (out of 24 divisions) by the number of employees (accounting for 0.7% of the total number of employees in the section), while for example *Manufacture of tobacco* takes the second place by productivity, and is at the end of the list by the number of employees (share of 0.3%). On the other hand, *Manufacture of food*, as the leading manufacturing industry by employment (with a share of 26.9% in the section), is only 19th with its efficiency: an employee in the manufacture of food produces by 39.4% less value added than an average employee in the domestic economy, i.e. is by 34% under the section average, which largely reflects on the level of efficiency of the manufacturing industry in whole. At the same time, an employee in manufacturing contributes by 8.2% less to the value added than the cited average employee in the domestic economy.

Measured for the total economy, it is exactly one-third of the total number of economic divisions of manufacturing that has more productive performances than the average economy, while the second half is composed of low accumulation activities in which labour efficiency is below the average. Considering that low productivity usually implies a large number of employees, the second group includes mainly labour intensive activities that employ twice more employees (more exactly, there is 2.1 times more labour force in this segment, but lower qualified) than the more efficient part of manufacturing. As for the number of employees, only one-third of the section succeeds to be more productive in terms of business operations than the whole economy. Understandably, employees from the first 12 ranked divisions, with a disproportionately relatively smaller share in employees (32.4%), are predominant in the production of GVA of total manufacturing (on average, with 55.9 percentage points).

As the more productive activities realise a larger value added per unit of input (unit of labour and fixed capital), they release an enviable potential and possibility for larger quantities of resources to be dedicated to the expansion and modernisation of production capacities. By embracing technological progress they multiply the productive effects of the invested labour, which accelerates development processes and continues to raise the perspective of growth of the mentioned division. The principal assumption of setting a long-term ascending trajectory of the value added is to focus on intensifying investment activity that serves productivity and accumulation. However, it is difficult, or almost impossible, to be turned to development if this way the total accumulation of a business subject is constantly exceeded, which is frequent in circumstances of low productivity. Limited accumulation capacity is often the direct consequence of low profitability and insurmountable obstacles to economic prosperity. The parts of the section with low efficiency generally have a hard time covering urgent replacement of depreciated assets, while the extension is only thought of in the context of external sources of capital financing through corresponding economic incentive packages.

In fact, the productivity performance of a section indicates not only its capacity to grow but only the possibility to sustain and enhance this growth, which is the premise of long-term survival in the global business world. Therefore, economic divisions at the top of the list of productivity have been recognised to be predominant in accelerating the whole economy because they possess the internal functional capacity to start and ensure growth on a sound basis.

TRENDS IN LABOUR PRODUCTIVITY IN MANUFACTURING IN SERBIA

From the viewpoint of growth stability in the long term, the volume of production does not provide relevant answers. Instead, an analysis should help grasp also qualitative changes that can indicate more concretely how the observed part of manufacturing will be ranked in domestic and international labour division in the forthcoming period. One can more reliably determine the direction and intensity of the development of manufacturing through the established productivity trend than through the achieved level of value added per employee. Therefore, for a development more efficient than the model of economic growth, the parameter of productivity dynamic is also introduced in the analysis, focusing on delineating the segment of the ascending and descending productivity (table 3).

Table 3. Tendencies in labour productivity in manufacturing industries in the Republic of Serbia, period 2016–2021

CA2010		Productivity growth		Employment growth ¹		GVA cumulative growth ² , %	Growth of the share in the section of manufacturing					
							In GVA			In employees		
		Rank	Cumulative rates of real growth ² , %	Rank	Cumulative rates of real growth ² , %		Change rate		p.p.	Change rate		p.p.
							Rank	%		Rank	%	
Total		-	5.8	-	15.4	22.1						
Manufacturing		-	-8.8	-	26.6	15.5						
Divisions with ascending labour productivity												
30	Manufacture of other transport equipment	1	225.8	4	49.3	386.6	1	261.3	1.1	10	-7.3	0.0
32	Other manufacturing	2	63.6	23	-3.0	58.7	3	34.5	0.5	23	-23.9	-0.5
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	3	41.8	24	-7.9	30.6	8	14.5	0.3	24	-25.4	-0.3
28	Manufacture of machinery and equipment n.e.c.	4	23.3	11	18.8	46.6	2	36.0	1.2	9	-6.8	-0.2
24	Manufacture of basic metals	5	23.2	8	25.7	54.8	4	30.9	0.3	5	4.7	0.1
20	Manufacture of chemicals and chemical products	6	17.4	14	12.8	32.4	13	6.1	0.3	11	-8.3	-0.2
19	Manufacture of coke and refined petroleum products	7	15.0	20	4.6	20.3	5	24.1	1.4	20	-13.8	-0.1
23	Manufacture of other non- metallic mineral products	8	12.1	13	13.2	26.9	10	7.4	0.3	12	-8.5	-0.3
12	Manufacture of tobacco products	9	10.5	22	3.2	14.0	17	-9.3	-0.1	21	-16.1	0.0
25	Manufacture of fabricated metallic products, except machinery and equipment	10	3.3	6	36.7	41.2	7	18.1	1.9	6	3.0	0.3
17	Manufacture of paper and paper products	11	2.5	7	27.2	30.3	12	6.1	0.2	7	0.9	0.0
Divisions with descending labour productivity												
33	Repair and installation of machinery and equipment	12	-4.1	10	20.7	15.7	9	13.1	0.2	8	-0.4	0.0
11	Manufacture of beverages	13	-6.6	21	3.9	-2.9	18	-12.4	-0.5	19	-13.5	-0.5
26	Manufacture of computer, electronic and optical products	14	-8.7	9	25.4	14.5	14	3.4	0.1	15	-10.5	-0.2

¹ The number of employees is obtained from the National Accounts calculation.² When calculating cumulative changes over 2016–2021, the data from 2021 are observed in relation to 2015.

Table 3. Tendencies of labour productivity in manufacturing in the Republic of Serbia (continued)
period 2016–2021

CA2010		Productivity growth		Employment growth ¹		GVA cumulative growth ² , %	Growth of the share in the section of manufacturing					
							In GVA			In employees		
		Rank	Cumulative rates of real growth ² , %	Rank	Cumulative rates of real growth ² , %		Change rate		p.p.	Change rate		p.p.
							Rank	%		Rank	%	
22	Manufacture of rubber and plastic products	15	-8.7	5	41.0	28.7	11	7.3	0.6	4	11.3	0.6
14	Manufacture of wearing apparel	16	-11.4	16	12.0	-0.8	22	-29.0	-1.2	14	-10.5	-0.8
13	Manufacture of textile	17	-12.0	17	11.8	-1.6	21	-24.0	-0.5	18	-11.9	-0.3
16	Manufacture of wood, products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	18	-12.3	15	12.8	-1.0	16	-8.6	-0.2	17	-11.0	-0.5
10	Manufacture of food products	19	-13.8	18	11.6	-3.8	19	-12.5	-2.5	16	-10.5	-3.0
15	Manufacture of leather and related products	20	-18.4	19	6.2	-13.3	20	-22.9	-0.4	22	-16.2	-0.5
21	Manufacture of furniture	21	-23.6	3	50.3	14.8	15	-4.4	-0.1	3	19.8	0.7
18	Printing and reproduction of recorded media	22	-31.0	12	14.6	-20.9	24	-54.1	-1.1	13	-10.2	-0.2
27	Manufacture of electrical equipment	23	-32.9	2	108.1	39.7	6	19.4	0.7	2	35.0	1.3
29	Manufacture of motor vehicles, trailers and semi- trailers	24	-69.3	1	122.4	-31.7	23	-40.3	-2.6	1	84.6	4.5

¹ The number of employees is obtained from the National Accounts calculation.

² When calculating cumulative changes over 2016–2021, the data from 2021 are observed in relation to 2015.

The above table identifies 11 divisions of manufacturing with a positive trend of labour productivity, and over the period 2016–2021 account altogether for 44.4% of the gross value added of total manufacturing. As it is followed by positive qualitative performances, it can be said that this production is founded on a sound basis. The remaining 13 divisions generate 55.6% of the gross value added of the total section, meaning that more than half of the newly created value comes from the part of manufacturing that faces in its business operations certain restrictions and potential difficulties, demonstrated through negative values of qualitative labour indicators. Therefore, when conceiving the economic policy, further development and functioning of this part of manufacturing should be approached carefully.

As the rank of divisions by productivity dynamic correlates with the rate of change in the share in GVA of manufacturing⁴, the activities with a positive trend of qualitative performances increase gradually their contribution to the total production of the section, and vice versa – efficiency falls leads to smaller share in the gross value added of the section, but not necessarily to a

⁴ The coefficient of correlation of the rank of the division by productivity dynamics and rank of the rate of change in the share in the GVA of manufacturing amounts to 0.74. On the other hand, the correlation between the rank of the division by productivity dynamics and rank of the rate of change of the share in employees of the total section of manufacturing is relatively weak and negative.

smaller share in employees (even though it could be generally assumed that because of a slower dynamic of economic indicators there will be to an extent less need for employing labour force).

The largest decrease in the share in manufacturing production, measured in percentage points, is recorded in the car *and food industry* – the fall of performance efficiency in the interval 2016-2021 influenced the stagnation also in terms of the share in creating gross value added, so that their potential share in the section fell by 2.6 p.p. and 2.5 p.p., i.e. by 40.3% and 12.5% (the 23rd and 19th place in GVA dynamics), respectively. While the decreased share of the food industry in the GVA of the section is followed by the decrease in the structure of employees of -3.0 p.p. (which even though the volume of labour force in the food industry has augmented the largest fall is noticeable in the structure of the section, measured in percentage points - cumulative growth of employees in manufacturing is twice more dynamic than the analogue movement in manufacture of food, 26.6% versus 11.6%). On the other hand, the car industry by the number of employees raises the relative importance by 4.5% (the largest increase in the section in terms of the rank of the dynamic of employees' share). The divisions of *manufacture of fabricated metal products, except machinery and equipment* and *manufacture of coke and refined petroleum products* are dominant in the increase of the share in GVA, observed in percentage points: 1.9 p.p. and 1.4 p.p., a change by 18.1% and 24.1% (the seventh and fifth place on the list of the relative change in the share), respectively. Such growth of the relative importance in the GVA of the section is followed by a more moderate change in the employment structure of 0.3 p.p. and -0.1 p.p. As far as the relative change in the share of the gross value added of the section, the biggest leap at the rate of 261.3% (the first place by the rank of share dynamics) was recorded in the division of *manufacture of other transport equipment*, which has raised its contribution in creating the GVA of the section by 1.1 p.p. As for the number of employees, the largest change in the share was registered in the car industry, 84.6%, amounting to 4.5 p.p.

When looking at the economic divisions of manufacturing, by cumulative rates of productivity growth over 2016-2021, the following divisions are on top of the list: *manufacture of other transport equipment*, 225.8%, *other manufacturing*, 63.6%, and *manufacture of basic pharmaceutical products and pharmaceutical preparations*, 41.8%. Even though having the smallest percentage in the section (0.7% average share of the gross value added in the production of total manufacturing), the *manufacture of other transport equipment* keeps the first place in raising productivity level with a simultaneous increase in the number of employees by 49.3%. The remarkable growth of the GVA of this division at the rate of 386.6% is the result of both the increase in the number of employees and in their productivity. In addition to this activity, another eight divisions of manufacturing (showed in the first part of table 3 - *Divisions with ascending labour productivity*) the ascending gross value added results from the synergistic contribution to qualitative and quantitative factors of labour input (manufacture of machinery and equipment, basic metals, chemicals and chemical products, coke and refined petroleum products, non-metallic minerals, tobacco products, fabricated metal products, and paper and paper products).

In contrast to the mentioned divisions, *other manufacturing* and *the pharmaceutical industry*, are at a high second and third place among the increasing divisions in manufacturing, in terms of labour efficiency (productivity growth rates of 63.6% and 41.8%), but by the criterion of employment, they are at the bottom of the table with a cumulative fall of 3.0% and 7.9%. These are in fact the only two divisions of manufacturing with a reduction in the number of employees in the observed interval, but they still achieve a very high dynamic of GVA at the rates of 58.7% and 30.6%, respectively.

On the other hand, the most pronounced labour productivity fall in the same period was recorded in the *car industry*, -69.3%, *manufacture of electrical equipment*, -32.9% and *printing and reproduction of recorded media*, -31%. This indicates that the most abrupt fall of productivity was seen in the divisions of manufacturing that are at the bottom of the scale (the first two places) in terms of the dynamic of the number of employees – in the car industry (cumulative growth of the number of employees of 122.4%) and manufacture of electrical equipment (cumulative employment growth rate of 108.1%), which altogether employ 11.9% of the labour force in the total section, an average in the observed period. It is not unusual that a low rank of productivity dynamic is followed by a high rank of employment dynamic (and vice versa) in certain activities of domestic manufacturing. Decreased productivity growth or its decrease, with a simultaneous increase in the number of employees, is mainly the result of the expansion of labour intensive activities driven by government subsidies, intended for opening new jobs and attracting new investors. In addition to the two mentioned divisions, the other 11 from the second part of Table 3 (*Divisions with descending labour productivity*) increased employment, but with a decrease in the value added per employee. Even besides the extension of the volume of labour input, a larger part of these activities records cumulative GVA fall - the increased number of employees did not succeed in compensating their efficiency in eight divisions: *manufacture of beverages*, *manufacture of wearing apparel*, *then textile*, *wood*, *food*, *leather*, *printing and car industries*, the latter experiencing a drastic fall of the gross value added by a cumulative rate of 31.7%.

It is worth mentioning that ascending productivity is experienced by the segment of the industry in which business operations are above average productivity in the total economy (presented in Table 2), which is understandable considering their stronger accumulation potential and consequential spiral of the benefit of augmented investments. However, two divisions with a productivity below average in the total economy, *other manufacturing* and *manufacture of basic metals* are positioned in the part containing the divisions with a positive labour productivity trend, owing to a pronounced cumulative growth of the GVA volume of 58.7% and 54.8%, respectively. *Other manufacturing* experienced a fall in the number of employees of 3% and jumped to the second place by rank of productivity increase, while the manufacture of basic metals shows an enviable growth also in employment (25.7%), yet still more than twice more moderate than the production of the value added, this division thus making fifth by qualitative dynamic even though it is at the bottom of the table (table 2) according to the average level of the value added.

On the other hand, from the group of divisions with above average productivity (table 2) the following three divisions experienced a productivity fall, thus are positioned in the second part of Table 3 according to this topic (*Divisions with a descending labour productivity: manufacture of beverages*, with a fall of labour efficiency of 6.6% due to the cumulative reduction of the value added by 2.9%, with a simultaneous increase in the volume of the labour force at the rate of 3.9%; then the divisions of *manufacture of computer, electronic and optical products* and *manufacture of rubber and plastic products*, which considerable GVA growth (14.5% and 28.7%, observed cumulatively) exceeds by far the dynamics of employment, by 10.9 and 12.3 percentage points, respectively, thus pushing down the value added per employee in both divisions by 8.7% each.

In such cases, where the expansion of the volume of labour input exceeds by far economic growth, two dilemmas are coming to mind: would a more moderate employment dynamic than the existing one, potentially result in affirmative qualitative indicators without the influence on the volume of production? Even if there is a risk of the GVA rate slowing down, the existential question remains: to what extent is it justified/possible to increase the volume at the expense of growth quality? The response partly offers an interpretation of empirical data. Generally, the validation of the efficiency of the economic policy (as well as of a programme and measures of the active employment policy), is expressed through the dynamic of the main macroeconomic aggregates. Production effects are examined from several aspects (quantitative and qualitative) by finding functional relationships between the variables of labour input and economic growth, which, in the context of profitability of the invested resources, enables to find the optimal solutions for the course of direction to take to develop certain segments of the national economy. For the analysis, it should be taken into account that the important aspect of efficiency parameters is their maturity because their values are not always usable for a serious analysis if they are calculated in short time intervals. Therefore, average quantitative relationships between the corresponding economic indicators are taken into account for a relatively long time span (2016-2021) for the calculation of the requested indicators. In order to draw a conclusion and obtain practical guidelines for economic policy stakeholders, a comparison of the variations of labour productivity and effects of that labour is made (diagram 3.1.), as well as of the variations in the volume and effects of labour (diagram 3.2) by industrial divisions.

Diagram 3.1. Dynamics of labour productivity vs GVA real growth, average for the period 2016–2021

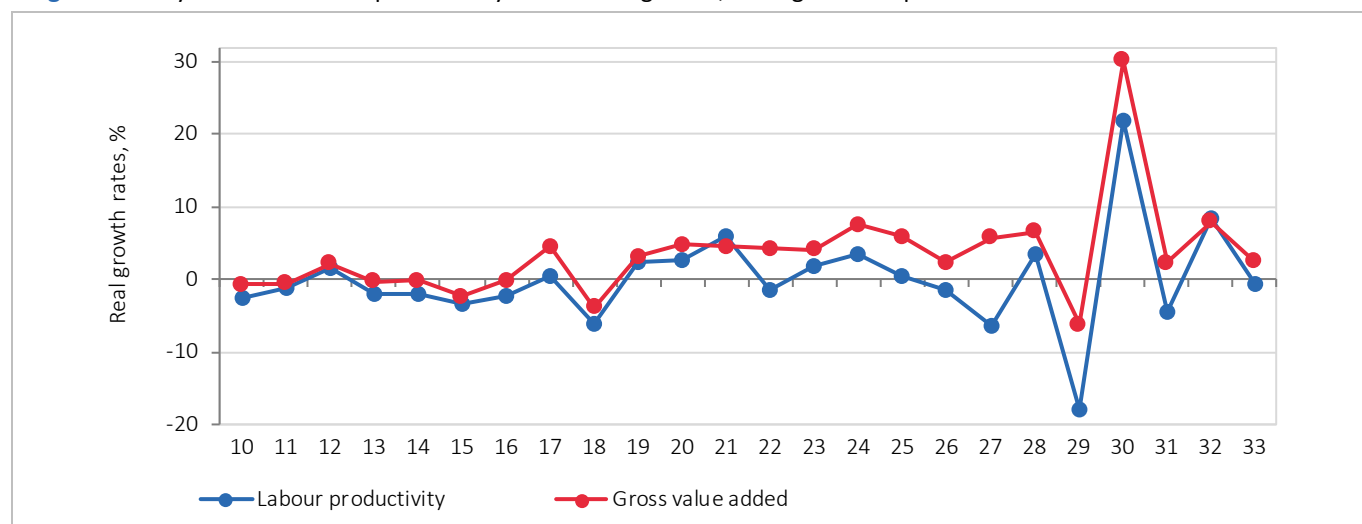
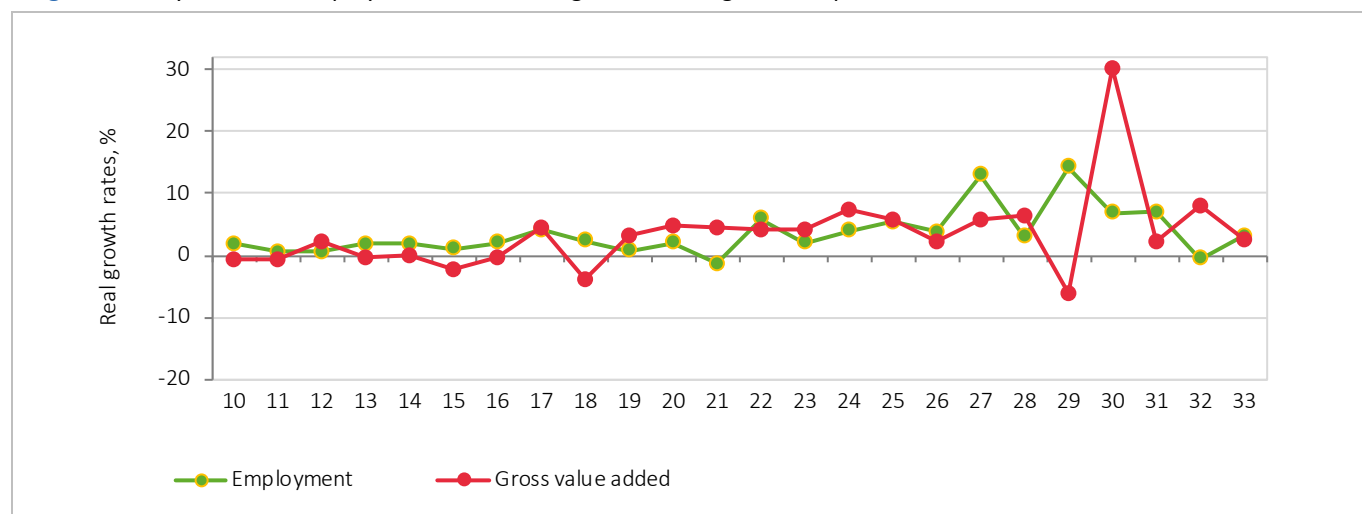


Diagram 3.2. Dynamics of employment vs GVA real growth, average for the period 2016–2021¹



¹ The diagrams show the codes of the Classification of Activities (CA 2010) of economic divisions of the section of manufacturing⁵.

- ⁵ 10 Manufacture of food
- 11 Manufacture of beverages
- 12 Manufacture of tobacco products
- 13 Manufacture of textile
- 14 Manufacture of wearing apparel
- 15 Manufacture of leather and related products
- 16 Manufacture of wood and products of wood and cork, except furniture
- 17 Manufacture of paper and paper products
- 18 Printing and reproduction of recorded media
- 19 Production of coke and refined petroleum products
- 20 Manufacture of chemicals and chemical products
- 21 Manufacture of basic pharmaceutical products and pharmaceutical preparations

- 22 Manufacture of rubber and plastic products
- 23 Manufacture of other non-metallic mineral products
- 24 Manufacture of basic metals
- 25 Manufacture of fabricated metal products, except machinery and equipment
- 26 Manufacture of computer, electronic and optical products
- 27 Manufacture of electrical equipment
- 28 Manufacture of machinery and equipment n.e.c.
- 29 Manufacture of motor vehicles, trailers and semi-trailers
- 30 Manufacture of other transport equipment
- 31 Manufacture of furniture
- 32 Other manufacturing
- 33 Repair and installation of machinery and equipment

The interdependence of labour productivity parameters and economic growth is illustrated by a high positive correlation (0.87 coefficient of correlation) of relevant economic variables by divisions of manufacturing (diagram 3.1). On the other hand, no important correlation has been established between the dynamic of employment and growth (diagram 3.2). However, even though no cause and effect link has been found between these two topics, in certain cases there was a strong negative effect of the employment dynamic on efficiency parameters, thus making them to deviate considerably from the movement of the corresponding newly-created value, e.g. in the divisions of *manufacture of rubber and plastic products* (CA22) and *manufacture of electrical equipment* (CA27): irrespective of the changes of technical and technological characteristics of the production process (knowing that the efficiency of production capacities is globally invariable on the short-term), the rise of the number of employees in these divisions, observed cumulatively, by 41.0% and 108.1% (table 3), has driven down labour productivity below zero, while the results of the production of the value added have remained the same (diagram 3.1).

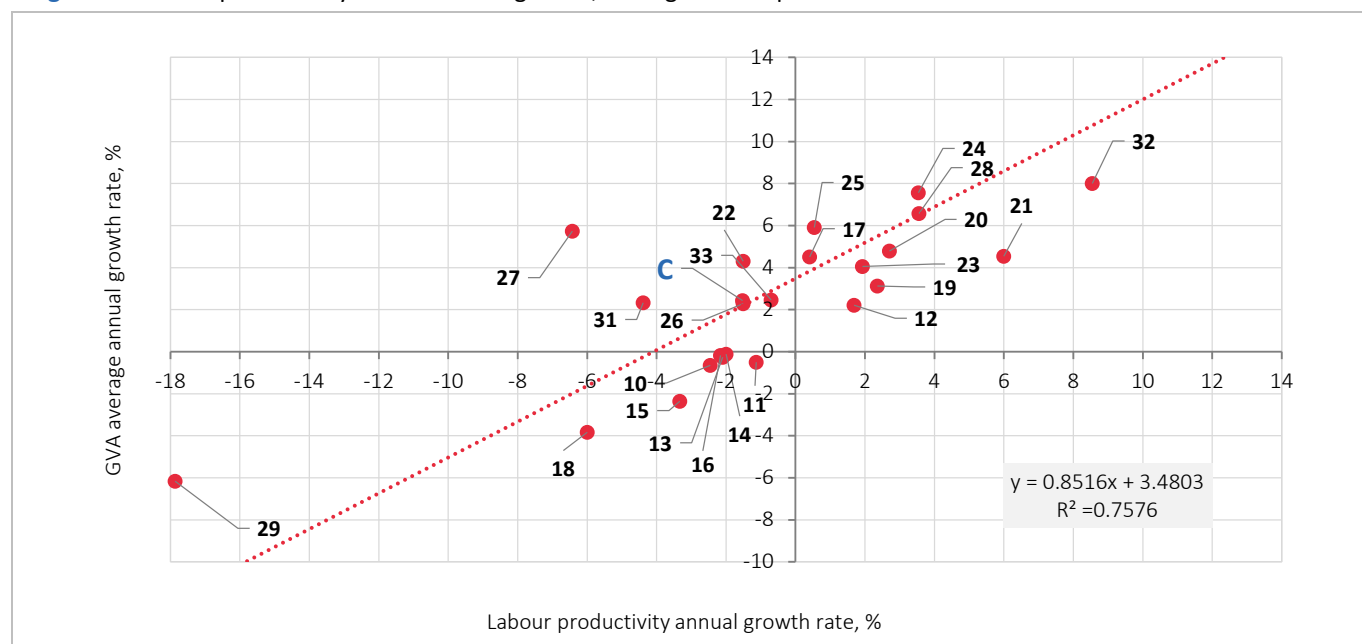
Therefore, if numerous exogenous impacts of short-lived character, the direction of the economic dynamic can only stem from the rise or stagnation of labour productivity. Having in mind the fact that only the activities that incite labour efficiency are positively economically valuated (through a realised relatively larger rate of the newly-created value), all the measures oriented towards new jobs where there is no increased production of the value added per unit of labour in relation to the current one should be put aside (naturally, for a certain period of time the priority of the economic policy can be something outside standard orientation towards growth and development, e.g. reduction of unemployment or overcoming another urgent social issue). From the viewpoint of sustainability, the economic policy causing productivity fall is not purposive. Recruitment outside economic criteria inevitably leads to resource exhaustion and deterioration of the substrate of social wealth, so that persevering with such measures could at one moment “come to bite us”. However, it should be emphasized that subsidies have never been a too large expense if motivated by economic and market, but not exclusively by social moments. Namely, if they are focused on business efficiency, positive results will be visible both on the macro and micro level, and a series of economic stakeholders will feel in the long-term a diversified performance of a smart economic policy (thus in the end, unemployment will be brought down to an acceptable framework).

There is no doubt that the measure in which an activity extends the volume of its activities is the starting point in all economic considerations. However, the key business performance can only be viewed through the prism of labour productivity. In fact, it is only by integrating both indicators, the volume and quality of growth, that trends in certain industrial divisions can be recognised, which is vital for planning and enhancing the economic dynamic. Mapping industrial divisions based on the dynamic of labour efficiency and effects, i.e. their grouping by quadrant in the diagram below⁶ allows an impartial assessment of the position, but also to view the potential course of direction and rhythm of the development of an activity. The interdependence of labour input quality and real growth of the newly created value is illustrated by average empirical relations from manufacturing business operations and the explanation through a linear regression model with high representativeness⁷.

⁶ In diagram 4 the values on the coordinate axes present average annual labour productivity growth rates and the gross value added, while earlier table 3 provides the cumulative dimension of these indicators for the period 2016–2021.

⁷ The obtained regression line in diagram 4 describes 75.76% of the functional relationship between relative indicators. While a high interdependence is confirmed between productivity growth and GVA growth, there is no quantitative dependency between the variables of employment rate and value added rate.

Diagram 4. Labour productivity and economic growth, average for the period 2016–2021¹



¹ The diagrams contain the codes of the Classification of Activities for the divisions of the section of the manufacturing industry.

QUADRANT I	QUADRANT II	QUADRANT III
30 Manufacture of other transport equipment ⁸	33 Repair and installation of machinery and equipment	11 Manufacture of beverages
32 Other manufacturing	26 Manufacture of computers	14 Manufacture of wearing apparel
21 Pharmaceutical manufacturing	22 Manufacture of rubber and plastic products	13 Manufacture of textile
28 Manufacture of machinery and equipment n.e.c.	31 Manufacture of furniture	16 Wood manufacturing
24 Manufacture of basic metals	27 Manufacture of electrical equipment	10 Manufacture of food
20 Chemical manufacturing	C Manufacturing	15 Manufacture of leather and related products
19 Manufacture of coke and refined petroleum products		18 Printing and reproduction of recorded media
23 Manufacture of other non-metallic mineral products		29 Can manufacturing
12 Manufacture of tobacco		
25 Manufacture of metal products, except machinery and equipment		
17 Manufacture of paper and paper products		

The presented regression model clearly shows real economic growth that can be expected at a given productivity rate, thus distinguishing productivity as the factor crucial for achieving the desired growth dynamic. Based on the values of relevant characteristics of industrial activities, the part of the regression line in the *first quadrant* includes the divisions with the largest production effects of the invested labour. The activities of manufacture of other transport equipment and other manufacturing stand out from the other parts of manufacturing by their positive qualitative performances. In contrast, at the bottom end of the regression line, in the *third quadrant* car industry is ranked the worst by the given characteristics, with extremely

⁸ The values of the division of *Manufacture of other transport equipment* outside the presented diagram because they stand out from the other divisions in the regression model. Even though the dynamic of productivity of this activities is established at a much higher level than the other divisions (growth rate of 21.8%), it is followed by a corresponding GVA growth (30.2%), so that the values of observation, even though grouped with the others on the axis of labour productivity, do not deviate considerably from the usual regression line.

unfavourable and qualitative results. Depending on the quadrant, certain manufacturing activities, depending on the place that they will take in economic flows in a forthcoming period, can be anticipated to a certain extent:

- Manufacturing divisions being positioned in the *first quadrant* (11 divisions altogether engage 26.6% of the entire contingent of labour force in manufacturing and create 44.4% of GVA of the section, on average, in the observed period) based on positive and qualitative and quantitative economic performances indicate that their business performance is on the right track, with a potential long-term sustainable growth. We are talking here of the divisions whose productivity exceeds the average level in the whole economy (over 2016–2021). Exceptions are the previously mentioned economic activities *manufacture of basic metals* and *other manufacturing*, which, even besides an under average efficiency (ranked 24th and 13th, table 2), created through intensified labour productivity, is the prerequisite for prosperous development in the long-term (with the cumulative rates of 23.2% and 63.6% they are at the top of the list by productivity dynamic - the fifth and second position, table 3), but more time is needed for the manifested positive tendencies to convert into a satisfying productivity performance⁹. In the process of mapping industrial activities according to the cited criteria, it is obvious that **the first quadrant represents a desirable place as the zone where growth has been established on a sound basis, with a potential for further affirmative economic trends in the following period as well.**
- *The second quadrant* in this model represents the zone of extensive growth. All the activities set above the horizontal coordinate axe have a positive business performance, but the way in which this result is achieved is the essential qualitative difference in business operations between the economic divisions in the first and second quadrant. While production in the first quadrant is characterised by increased productivity, in the second quadrant growth relies on an increased labour input. The employment rate in the divisions from the second quadrant is, on average, twice more dynamic than the growth of the gross value added - employees achieve a positive dynamic of the total value added but cannot maintain its level per employee over time. Even though positive production represents an affirmative characteristic of economic processes in this part of the model, one cannot forget that it is impossible to maintain this situation in the long term and the confirmed high dependency of economic growth on labour productivity. Extensive business operations cannot maintain a favourable growth rhythm, but in the context of development processes, they have to include also the efficiency of engaged resources. It would be desirable, as much as possible, to avoid over-employment, thus it is a challenge for economic policymakers to implement incentive measures that condition not only the number but also the quality of new jobs.

In addition to the identified five divisions that generate growth extensively (manufacture of furniture, electrical equipment, rubber and plastic products, computers, as well as repair and installation of machinery and equipment, altogether employing, on average, 17.1% of employees in manufacturing), based on relevant data **the section of total manufacturing is also placed in the second quadrant. Total manufacturing owes its growth over 2016-2021 mainly to more intensive engagement of the labour force, with a minor or even negative labour contribution¹⁰.** Knowing that business operations in the second quadrant is often on the verge of profitability, with a real fear for it to fall into the zone of negative results (i.e. the third quadrant), it is necessary to apply systematic economic policy measures to extract the aggregate of manufacturing from the area of inefficient business operations, particularly having in mind its volume and role in the whole economic development, as well as repercussions on the entire economy that can result from the slowing down of this industrial segment.

- At the bottom of the left quadrant (*Quadrant III*) there are eight labour-intensive manufacturing divisions (food, textile, wood and car industry, then the division of printing and reproduction of recorded media, as well as manufacture of beverages, wearing apparel, leather and related products), which business performance is in the zone of negative results, both by quantitative and qualitative criteria. These are all economic activities with level productivity under the average in the country (except the manufacture of beverages, ranked eighth by the average productivity level, but with warning negative indicators of business performance dynamic in the period 2016–2021. – cumulative productivity rate of -6.6% and gross value added of -2.9%). These activities engage on average, 56.3% of the entire contingent of the labour force in manufacturing (one-four or employees of the whole section, 26.9%, are in the manufacture of food). **There is no dilemma that such values of business performance indicators point out to serious difficulties faced by a part of the economy, and these difficulties must not be neglected in future development plans,** instead, they should be reviewed impartially, without insisting on the demonstrated unsustainable solutions. Setting these activities on a sound basis requires extreme efforts and

⁹ Business performance of the division Other manufacturing has been exceeding since 2019 the average of the total economy by its labour productivity (RSD 1452 mill. CL2015 versus 1414 in the same units, the average in 2019).

¹⁰ See diagram 1: contribution of labour and employment productivity to the GVA real growth in manufacturing.

government intervention via adequate incentives and reform processes, which would potentially determine the future development of these economic activities.

- In *quadrant IV* there are no divisions of manufacturing, i.e. no descending rate of the gross value added is registered in either division with a growth of labour productivity (although such cases are theoretically possible, but are not confirmed empirically in this analysis).

The position occupied by a division in the presented regression model is a good indicator of the prosperity of this part of manufacturing, i.e. indicator of its potential to initiate and maintain dynamic growth and development. The presented mode offers guidelines for determining the course of direction to take in business and can be used in different ways, depending on the current economic strategy. Mapping the parts of manufacturing can be a useful tool for economic policy stakeholders in terms of reviewing the measures to be implemented - while in the part of manufacturing located in the first quadrant, it is necessary to support and stimulate the already favourable economic environment, and with the segment in the second and third quadrants it is necessary to undertake adequate steps in order to create a further perspective of growth and development. Business performance in the third quadrant is particularly menaced (where there is no return of capital on invested resources, but on the contrary, the latter are diminishing), so it is vital to launch an adequate set of measures that would overcome production restrictions and move the values of referent coefficients of these parts of the economy in the zone of positive performance on the efficiency scale.

INFLUENCE OF PRODUCTION CONCENTRATION ON LABOUR PRODUCTIVITY IN MANUFACTURING

From the viewpoint of growth and development sustainability, it is necessary to examine and take inevitably into account also the influence of production concentration on the efficiency of the domestic economy. The dynamic of economic indicators in certain activities has often been determined in the last decade by business operations of a minor number of large companies, with a series of positive and negative effects that follow the economic domination of the biggest systems in different segments of manufacturing.

The expressed concentration in production can be observed as the main lever of growth of an industrial activity if the leading enterprises in it are in the ascending phase (such as for example due to a strong investment cycle of the FIAT company in 2012 the whole car industry experienced an impressive growth at the rate of 146% in the following year). On the other hand, it is almost impossible to avoid the negative consequences when one relies mainly or even exclusively on the production effect of large business systems in the period when their economic activity is slowing down or stagnating. Generally, excessive concentration of production in “the hands” of dominant companies is not regarded as the best foundation to establish stable growth because in this way the functioning of the whole division is exposed to the consequences of some business decisions and courses of direction. Therefore, the concentration of production can give a useful initial impulse to economic development, but if an entire series of accompanying measures does not support the broad growth of business operations in this part of the economy, it could happen that positive results will be lacking in a forthcoming period.

A strong presence of the concentration of production is noticeable in the activities on the bottom of the scale, by the productivity dynamic in the manufacturing-car - car industry and manufacture of electrical equipment. In fact, the fall in the value added is the cause of the drastic reduction of their efficiency, generated per unit of labour by the industrial systems of these divisions, such as Fiat, Leoni and Yura. Namely, **the companies that dominate by the relative importance in the creation of the gross value added – Fiat and Yura in the car industry and Leoni in the manufacture of electrical equipment, do not shape only the economic flows within the activity in which they are classified but often determine considerably how the whole sector will work.** Some of the indicators of the mentioned companies are provided below¹¹.

- *Fiat*: the gross value added of Fiat was higher 2.5 times in 2021 than in 2016. As Fiat generates almost a third of the gross value added in the car industry (on average 29.3%), this reduction of production reflected through a sharp fall of GVA of the whole section - the cumulative decrease in the results of the car industry amounted to 31.7%, which, with a stronger employment dynamic at the rate of 122.4%, showed an alarming productivity fall of 69.3% in the observed period (table 3).

¹¹ Data source: Business Registers Agency and calculation of the National Accounts.

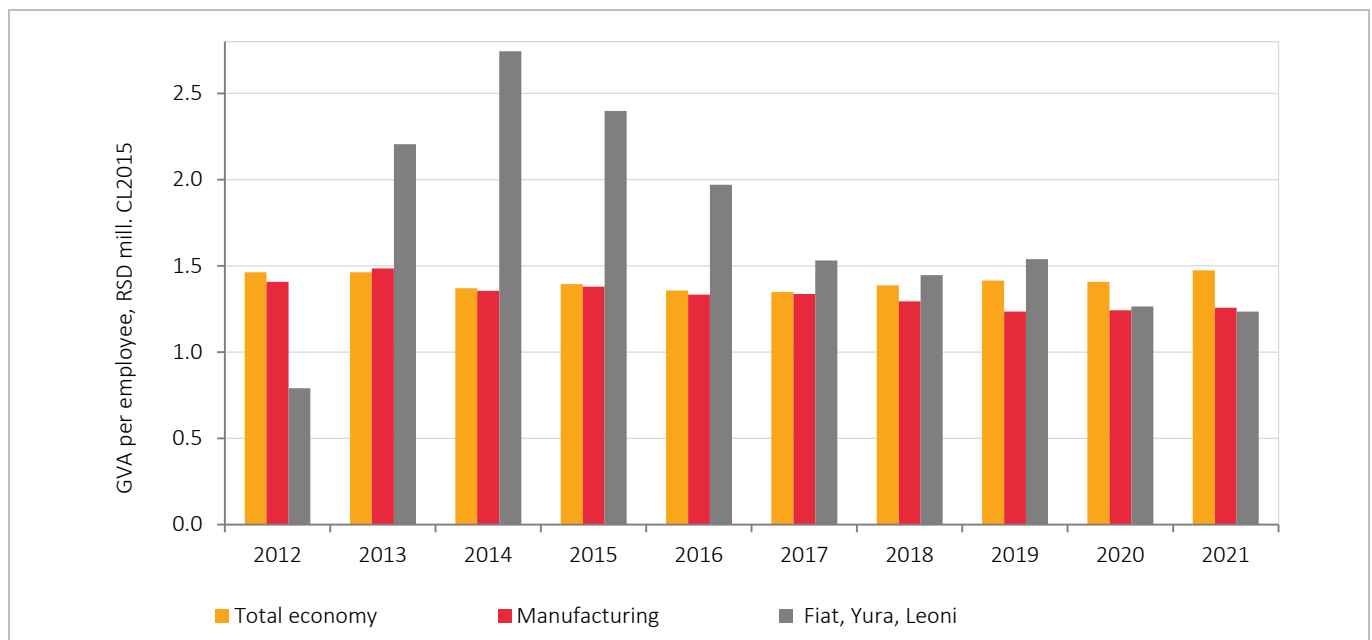
- *Yura*: the company Yura contributes, on average, with 16.1% to GVA creation in the car industry. The rate of the cumulative growth of employees is twice higher than the changes in the newly created value (32.9% versus 16.6%), which is the result of a productivity fall of 12.3% in this company too.

The companies Fiat and Yura engage altogether almost a fourth of employees (23.1%, on average) and generate, on average, 45.4% of the gross value added in the car industry, thus significantly dictating the rhythm and course of direction of labour productivity in this activity.

- *Leoni*: over 2016–2021, the relative GVA importance of the company Leoni in the division *Manufacture of electrical equipment* amounted to 3.7%, on average. In addition to the impressive growth, the dynamic of employing a labour force exceeds the growth of the gross value added, on average, by 151.2 percentage points, so that labour productivity went down also in the company Leoni almost by a fourth (24.4% in observed period). Thus, the activities of this company did not make the division move in the desired direction, i.e. from the second quadrant and zone of negative qualitative indicators in the first quadrant, in terms of business performance (see diagram 4).

The summary labour productivity in the three mentioned companies (expressed in value added per employee¹²) is demonstrated in the relations of efficiency change of the total economy and the section of manufacturing in the diagram below.

Diagram 5. Productivity of employees by aggregated segments of the economy



The ascending phase and investment impulse of the observed companies resulted in a strong positive dynamic of their both quantitative and qualitative economic performance over 2012-2014. During 2014, the employees of these companies produced twice bigger value than the average employees in the section of total manufacturing or total economy. However, after 2014, labour efficiency dramatically dropped (2.2 times lower productivity than in 2021 relative to the record year 2014), so that the productivity of the selected companies in 2020 was below the average of the total economy, and in 2021 even below the level of total manufacturing. Even though their business performance was planned to be the driving force of economic growth, investments in them did not happen and were not supported by the adequate package of measures, which brought them to the level of below-average companies in manufacturing, by the lowest parameters (quality) of growth. Such a downfall affected directly and indirectly the performance of the entire section of manufacturing, and since 2018 it has lagged considerably behind the total economy by the quality of production.

¹² The value scale presents the real amounts of GVA production per employee in chained measures of the volume, expressed at 2015 prices (mill. RSD CL2015), which ensure data comparability in the entire observed period.

A stronger employment dynamic, encouraged by government subsidies, absorbed quality labour factors, which in the process of establishing a new balance resulted in smaller values of the indicators of productivity in the selected labour-intensive companies. The following two diagrams show a summary picture of quantitative and qualitative economic processes in the above mentioned companies during the last decade.

Diagram 6. Fiat, Yura, Leoni – business performance, summary indicators of the companies

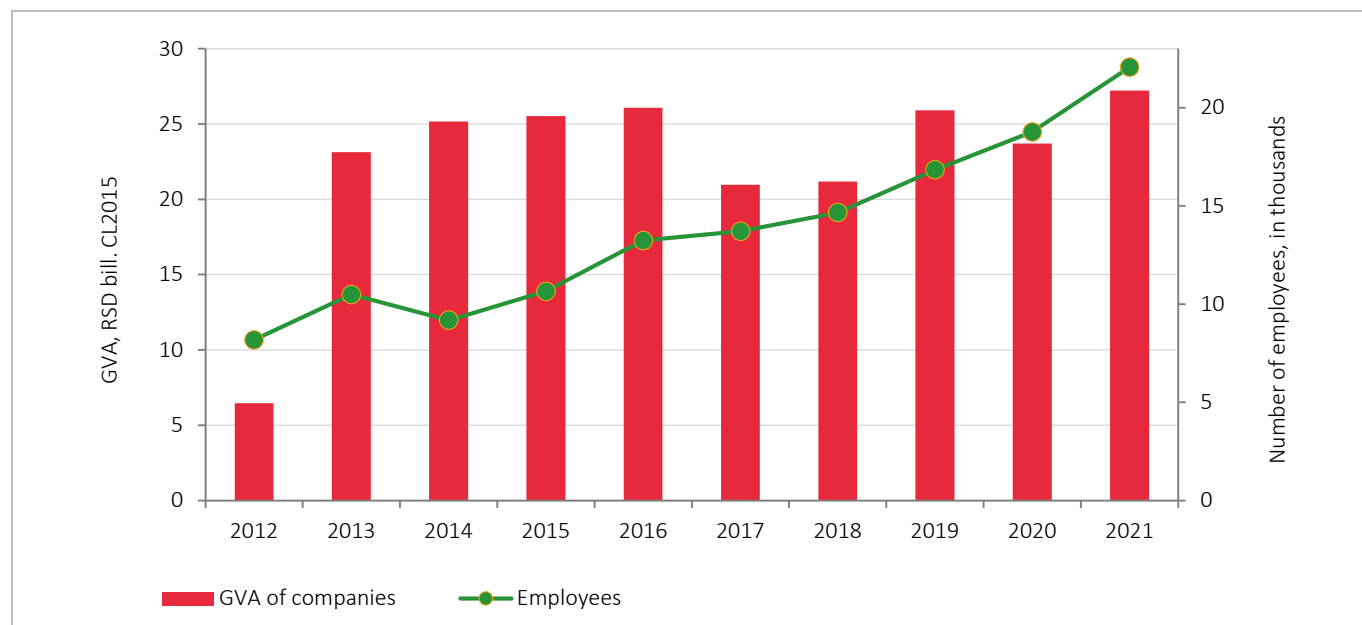
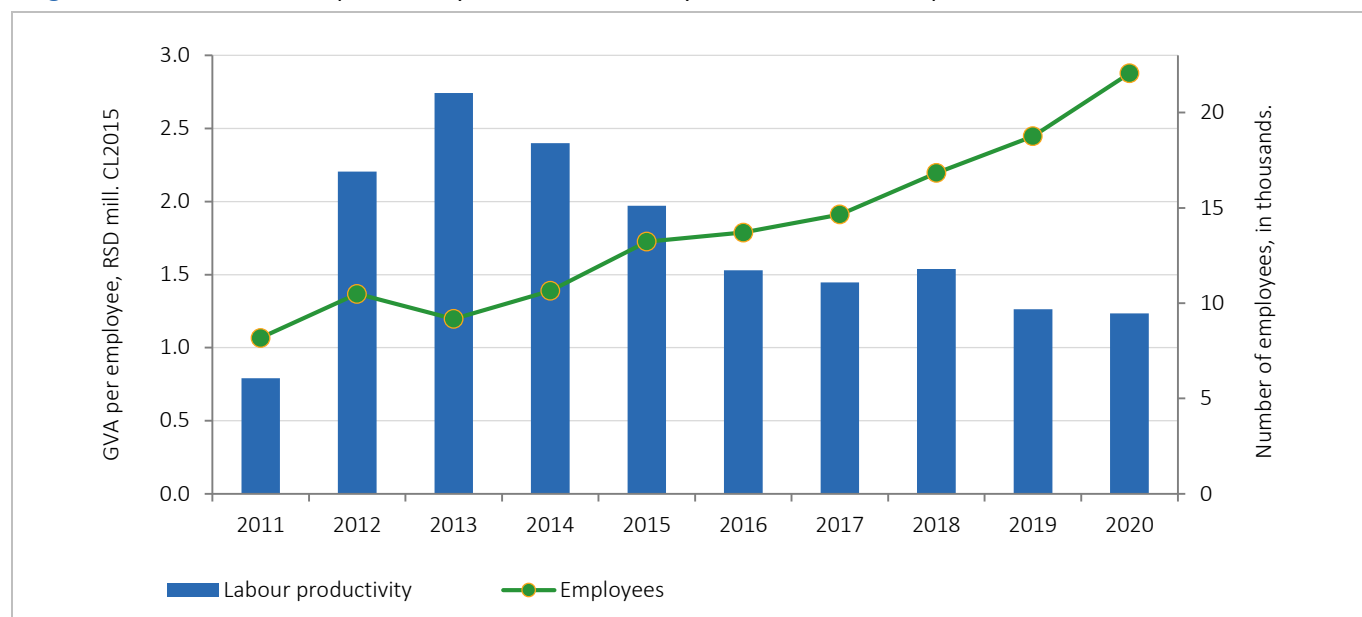


Diagram 7. Fiat, Yura, Leoni – productivity indicators, summary indicators of the companies



The mentioned incentive measures can be seen through a triple extension of the volume of labour, i.e. a cumulative increase of 258.9% in the observed period. However, while employment is strongly going up, it is evident that the GVA dynamic cannot follow this trend. The growing number of employees produces the same, if not a considerably lower volume of value added (in 2017 and 2018), which is inevitably expressive of a significant fall in their efficiency (clearly visible in diagram 7).

These companies experienced a growth of labour volume and productivity only in the first two years of the observed ten-year period. Since 2014, the number of employees and their efficiency have taken different directions (in 2021 the productivity of employees was lower by 55% than in 2014, while at the same time their number increased by 140.4%), which led to the stagnation or even slowing down of production dynamic in certain years. Having in mind that only positive qualitative performances ensure prosperous development, the change in the value illustrated in the bars of the second diagram (diagram 7) tells more of the variations of the gross value added of the companies from the first diagram (diagram 6), as far as their long-term sustainable business performance dynamic is concerned. The downward tendency in the qualitative labour input is a warning signal that the growth rate is decelerating in the forthcoming period. In those cases, the response of society is of vital importance for finding long-term qualitative restrictions. If an appropriate reaction is ignored or lacking, the companies could find themselves on the verge of survival, which can remain without echo in the activities they are part of.

Even though the selected companies are relatively very important in terms of the number of employees and the production of the gross value added, and for business course of direction of the activities they belong to, often determining. The business performance of a large number of small-size and medium-size companies in the rest of the section should not be negligible when it comes to the qualitative performance of total manufacturing. In order to view the business performance of manufacturing outside the direct impact of the mentioned large companies (the indirect effect is not taken into account in this analysis), the text below provides a comparative review of productivity in three aggregated manufacturing segments: in the section of total manufacturing, in the part of manufacturing excluding Fiat, as well as in the part of manufacturing excluding Fiat, Leoni and Yura.

Table 4. Labour productivity dynamic in aggregated classes of manufacturing

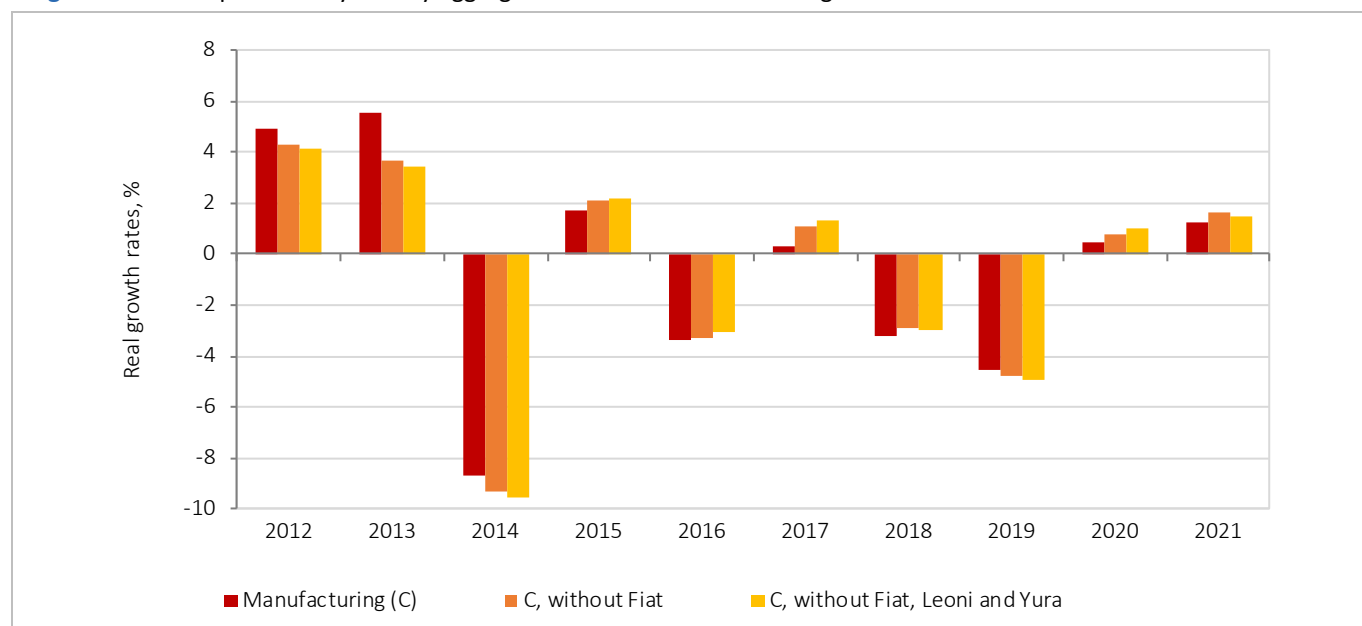
	Annual rates, %									Cumulative rates, % ¹		
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2012-2015	2016-2021
Manufacturing	4.9	5.5	-8.7	1.7	-3.3	0.3	-3.2	-4.6	0.5	1.2	2.8	-8.8
Manufacturing excluding Fiat	4.3	3.7	-9.3	2.1	-3.3	1.1	-2.9	-4.7	0.7	1.7	0.1	-7.4
Manufacturing excluding Fiat, Leoni and Yura	4.1	3.4	-9.6	2.2	-3.0	1.4	-3.0	-4.9	1.0	1.5	-0.5	-7.0

¹ In the calculation of the cumulative change in the period 2012-2025, the data are observed in relation to 2011, and for the period 2016-2021 in relation to 2015.

Observed cumulatively, over 2012–2015 the companies Fiat, Leoni and Yura contributed positively to the productivity performance of the section, primarily owing to the impressive growth of the value added per employee during the interval 2012–2014 (see diagram 5) – by being excluded from the analysis, productivity dynamic switched to the negative one, -0.5% versus 2.8%. However, already in 2015 (excluding 2019 when a modest qualitative growth was recorded), the course of direction of this impact changed due to the drastic fall in labour productivity. Abstracting the summary effect of the mentioned companies over 2016-2021 did not bring change in the negative sign of cumulative productivity rate, but it showed that the fall of the efficiency of the rest of manufacturing (outside the direct influence of the industrial complexes) was more moderate, by 1.8 p.p. (-7.0% versus -8.8%). Also, if only Fiat is excluded from the calculation, the cumulative productivity rate of the part of manufacturing without this company is above the productivity of total manufacturing by 1.4 p.p. (-7.4% versus -8.8%). Such an unfavourable impact on the parameters of total productivity is mainly because the production of the value added of the mentioned companies did not succeed in following their employment dynamic, strongly supported by government subsidies in the entire observed period. In the interval 2016–2021, the cumulative growth of the newly created values lags behind the change rate of the volume of the labour force in all three companies, Leoni, Yura and Fiat, by the significant 151.2 p.p., 16.4 p.p. and 26.1 p.p., respectively.

The comparison of the dynamics of the productivity of the selected segments of manufacturing is illustrated in the chart below.

Diagram 8. Labour productivity rate by aggregated classes in manufacturing



Even though the efficiency of large companies in the period prior to 2015 increased, and afterwards decreased, the productivity of total manufacturing, setting aside their direct performance unexpectedly did not influence the sign of the productivity rate in the rest of the section in either year of the observed ten-year interval. One cannot neglect the fact that, even if this analysis does not consider it, the indirect impact of the mentioned companies was really present through a chain of supply, neither the horizontal and vertical connection and “shifting” of positive and negative effects to other economic stakeholders linked by the business process.

Although in a development phase some clearly measurable benefits of production concentration were realised, relying on this kind of business performance can generally produce negative repercussions on the whole section if, due to discretion business decisions of leading business subjects, their dynamic slows down. **It is proved empirically on the example of domestic manufacturing in the last decade that linking the economy to the economic destiny of a company, i.e. strategic focusing on large industrial complexes of labour-intensive organisations did not generate the expected qualitative effect in the long-term.** In order to prevent and absorb potential consequences caused by certain development policies, **it is necessary to mobilise additional resources and systematically stimulate the exhaustiveness of business operations as a stable basis for establishing prosperous and sustainable growth.**

TECHNICAL AND TECHNOLOGICAL PROGRESS AND ECONOMIC STRUCTURE OF PRODUCTION CAPACITIES SERVING LABOUR PRODUCTIVITY

Besides specific business decisions and development policies implemented by large industrial complexes, quality and courses of the direction of economic growth of certain manufacturing divisions are also considerably affected by technological characteristics and accompanying structures of production capacities. The differences in the achieved level of technical progress by industries are the main reason why economic allocation of increase in production does not correspond completely to the economic structure and dynamic of production input. **Based on the technological intensity of a production process a general classification of activities in manufacturing has been performed into the sections of high, medium-high, medium low and low technologies (see Table 6). The degree of the technological intensity of a production process shows the predisposition of a division for achieving a dynamic and level of labour productivity.** It is globally assumed that the activities, classified into the category with the highest technical and technological level of business operations, generate better economic performances (in terms of the value of qualitative and quantitative indicators of economic growth) in relation to the segment of the industry with a lower technological level.

When the labour productivity of domestic manufacturing is observed in the context of technological intensity level, the mentioned regularity in the dynamic of indicators can be seen, except for medium-high technology, where unexpectedly the business performance is taking a descending path in terms of efficiency - the table below provides a review of relevant variables by aggregated manufacturing divisions.

Table 5. Labour force productivity indicators in manufacturing by the technological intensity of the activity¹

	Real growth rate, %							Share in the section of manufacturing, %
	2016	2017	2018	2019	2020	2021	Average rate	
							2016–2021	
High technologies								
GVA	5.5	7.4	-8.8	10.6	5.9	1.4	3.5	4.7
Number of employees	11.8	-1.4	-1.3	3.0	-0.8	-0.1	1.8	2.4
Labour productivity	-5.7	8.9	-7.6	7.4	6.8	1.5	1.7	-
Medium-high technologies								
GVA	0.3	6.3	1.5	0.0	-1.2	9.4	2.6	20.3
Number of employees	8.8	8.3	13.6	8.3	-1.2	17.2	9.0	18.8
Labour productivity	-7.8	-1.9	-10.7	-7.7	0.0	-6.6	-5.9	-
Medium-low technologies								
GVA	4.8	7.9	4.8	3.5	1.2	8.5	5.1	35.5
Number of employees	7.6	5.5	4.9	8.7	0.1	1.5	4.7	24.1
Labour productivity	-2.6	2.3	-0.1	-4.8	1.1	6.9	0.4	-
Low technologies								
GVA	2.7	0.9	-0.1	-4.2	0.0	0.4	-0.1	39.5
Number of employees	5.2	2.7	2.4	2.1	0.5	0.4	2.2	54.7
Labour productivity	-2.4	-1.8	-2.5	-6.2	-0.4	0.0	-2.2	-

¹ The aggregation of manufacturing by technological intensity is done at the level of economic divisions (detailed data at the industrial groups level are not available).

The average structure of the gross value added by the presented groups in the scope of manufacturing is not proportionate to the distribution of the labour force. Namely, in the zone of *high technology* engaged employees produce almost twice the larger GVA relative part in relation to its percentage share in the total number of employees in manufacturing (4.7% versus 2.4%), generating the cumulative growth of labour productivity of 10.5% (table 6). The fact that employment in these activities is positively economically valorised (through the realised relatively larger part of the newly created value) speaks enough in favour of **the affirmation of more efficient investment in companies in the zone of high technologies. Nevertheless, it is only in this segment of manufacturing that the number of employees shows a downward tendency** (negative employment rates over 2017-2020, except for 2019, table 5). Such an occurrence can be a warning indicator of the change in the distribution of industrial employees towards a decrease in the modest relative importance of economic activities at a higher technological level. With an average year-on-year productivity growth rate of 1.7%, this section is counted in the more prospective part not only of manufacturing but also of the whole domestic economy. Therefore, **establishing a positive employment trend in the areas where the results of more intensive investment in the labour force can be seen through the even more dynamic economic growth, is a purposive economic direction.** In order to accelerate the already present positive tendencies in the mentioned class and use affirmative conditions for the production of the largest possible value added with minimum investment, it is necessary to direct additionally the flows of human resources towards adapted instruments of the economic policy, and not go only with the flow of the existing favourable effect of economic rules. This would facilitate the efficient reorganisation of the economy towards larger profitability at the level of the whole economy.

On the other hand, in the labour-intensive section of *low technologies* the newly created value is realised in the entire presented period at considerably lower rates compared with the intensity of employing labour force, which results in the deceleration of productivity at the average year-on-year rate of -2.2%, that is -12.6%, measured cumulatively (table 6). In contrast with the groups that are doing business at a higher technological intensity level, the employees of this part of manufacturing generate a relatively smaller value added - for a production of almost 40% of the gross value added of the section, more than a half of the total number of employees in manufacturing (54.7%). As already said, the average structure of the value added is not proportional to the volume of investment in these sections, mainly because of the at that time production structure but also because of the variations of production labour effects in different activities.

Even if, globally, it can be assumed that the labour productivity rate in question is on an ascending path in the activities at a lower technological level, a deviation from this general rule is recorded in the section on *medium-high technologies*. This division, besides the economic growth at the average rate of 2.6%, with a pronounced dynamic employment (year-on-year growth of 9% in the same period) indicates a sharp fall of productivity of 5.9 per cent annually, on average, i.e. -30.4% observed cumulatively. The reasons for such an unfavourable tendency in the section of medium-high technology can be viewed by examining the efficiency of labour force resources, diversified by divisions of manufacturing (table 6 below).

Table 6. Labour productivity in manufacturing by the level of technological intensity of economic divisions¹

	Real rates of labour productivity, %								Share in the section of manufacturing, %	
	Cumulatively	Average, annually	2016	2017	2018	2019	2020	2021		
	2016–2021								GVA	Employment
High technologies	10.5	1.7	-5.7	8.9	-7.6	7.4	6.8	1.5	4.7	2.4
21 Manufacture of basic pharmaceutical products and pharmaceutical preparations	41.8	6.0	-4.2	14.2	12.0	13.1	1.4	0.9	2.5	0.9
26 Manufacture of computer, electronic and optical products	-8.7	-1.5	-3.6	4.2	-22.5	3.7	11.8	1.1	2.2	1.5
Medium-high technologies	-30.4	-5.9	-7.8	-1.9	-10.7	-7.7	0.0	-6.6	20.3	18.8
20 Manufacture of chemicals and chemical products	17.4	2.7	9.1	11.7	0.8	-3.8	-2.0	1.4	5.8	2.4
27 Manufacture of electrical equipment	-32.9	-6.4	-22.7	-6.9	-18.3	-14.7	26.8	5.6	3.6	4.6
28 Manufacture of machinery and equipment, n.e.c.	23.3	3.6	-12.5	23.1	2.6	-5.3	5.3	12.0	4.2	2.8
29 Manufacture of motor vehicles, trailers and semi-trailers	-69.3	-17.9	-8.2	-21.4	-23.0	-9.2	-24.4	-19.5	4.8	7.3
32 Other manufacturing	63.6	8.5	-0.8	6.4	17.1	18.6	8.3	3.0	1.8	1.7
Medium-low technologies	2.5	0.4	-2.6	2.3	-0.1	-4.8	1.1	6.9	35.5	24.1
19 Manufacture of coke and refined petroleum products	15.0	2.4	-3.9	4.3	7.7	0.3	2.0	4.0	7.2	0.7
22 Manufacture of rubber and plastic products	-8.7	-1.5	3.8	4.3	-4.8	-3.4	-8.6	0.4	8.3	5.7
23 Manufacture of other non-metallic mineral products	12.1	1.9	1.0	4.8	3.8	-9.0	3.4	8.3	4.3	2.8
24 Manufacture of other metals	23.2	3.5	9.0	16.6	11.9	-6.7	-12.8	6.4	1.2	2.7
25 Manufacture of fabricated metal products, except for machinery and equipment	3.3	0.5	-5.4	3.9	-3.2	1.6	3.2	3.5	12.1	10.1
30 Manufacture of other transport equipment	225.8	21.8	-5.3	-5.4	11.7	32.6	4.4	135.1	0.7	0.5
33 Repair and installation of machinery and equipment	-4.1	-0.7	-6.9	-17.5	14.5	-0.4	9.8	-0.4	1.7	1.6

¹The aggregation of manufacturing by technological intensity is done at the economic divisions level (detailed data at the industrial groups level are not available).

Table 6. Labour productivity in manufacturing by the level of technological intensity of economic divisions¹ (continued)

	Real rates of labour productivity, %								Share in the section of manufacturing, %	
	Cumulatively	Average, annually	2016	2017	2018	2019	2020	2021		
	2016–2021								GVA	Employment
Low technologies	-12.6	-2.2	-2.4	-1.8	-2.5	-6.2	-0.4	0.0	39.5	54.7
10 Manufacture of food products	-13.8	-2.5	-3.2	-3.3	-3.2	-5.8	3.6	-2.6	18.3	26.9
11 Manufacture of beverages	-6.6	-1.1	-2.3	-2.3	3.3	-3.8	-5.0	3.6	4.0	3.1
12 Manufacture of tobacco products	10.5	1.7	13.0	5.6	-10.7	1.5	-2.0	4.3	1.4	0.3
13 Manufacture of textile	-12.0	-2.1	-0.7	4.2	-14.2	-5.8	13.0	-6.9	1.8	2.4
14 Manufacture of wearing apparel	-11.4	-2.0	4.7	-4.7	-1.4	-5.3	-8.4	3.8	3.7	7.5
15 Manufacture of leather and related products	-18.4	-3.3	-12.6	-8.3	-0.4	-1.7	-14.1	21.1	1.3	2.7
16 Manufacture of wood and cork, except for furniture; manufacture of products of straw and plaiting materials	-12.3	-2.2	-8.9	12.3	2.6	-25.0	2.1	9.3	2.2	4.4
17 Manufacture of paper and paper products	2.5	0.4	-3.1	4.2	1.5	2.0	-4.9	3.2	3.2	1.7
18 Printing and reproduction of recorded media	-31.0	-6.0	0.5	-10.3	-3.4	-10.9	-11.1	0.2	1.3	2.0
31 Manufacture of furniture	-23.6	-4.4	0.5	1.5	-0.1	-9.6	-3.4	-14.1	2.3	3.7

¹ The aggregation of manufacturing by technological intensity is done at the economic divisions level (detailed data at the industrial groups level are not available).

The analysis brought down to the lower level of aggregation indicates that productivity falls at the level of the total section of medium-high technology is due to unfavourable flows stemming from two divisions (out of five in total, classified by technology intensity in this group): car industry and manufacture of electrical equipment. The specific characteristics of the division are that they are in leading positions when it comes to employment dynamic over 2016–2021: the cumulative growth of the number of employees in the car industry and manufacture of electrical equipment in the observed period reaches impressive rates of 122.4 and 108.1 percents (table 3), respectively. As this dynamic of employment is not followed by adequate growth of the newly created value, the reduction of qualitative indicators is inevitable. While in the car industry labour productivity fall is permanent during the entire interval, in the manufacture of electrical equipment there are visible elements of recovery in the last two years, when the indicators of labour efficiency record a positive value (26.8% and 5.6% in 2020 and 2021).

The divisions of the car industry and manufacture of electrical equipment (within which are the large companies Fiat, Yura and Leoni) participated considerably over 2016–2021 in the group of medium-high technologies: 62.8% in the number of employees and 41.7% in GVA, so that the negative values of productivity variables of these activities (cumulative fall of 69.3% and 32.9%) led to a drastic fall of productivity of the whole group of 30.4% (even though, according to the general rules, this part of industry implies an increasing business efficiency). However, such movements are not surprising knowing that the labour productivity of the mentioned large companies strongly shapes the qualitative performances of the divisions to which they belong, all in compliance with their relative importance (it has already been mentioned that Fiat and Yura generate altogether 45.4% of the gross value added in the car industry, while the average share of the company Leoni amounts to 32.7% in the GVA of the manufacture of electrical equipment over 2016–2021). **The tendency of a stronger recruitment of labour force and specific development policies in the mentioned business subjects direct economic flows in these two divisions and often affect also the qualitative performance of the entire section.**

As the divisions are qualified as medium-high technological, there is inevitably a potential for dynamic growth and higher productivity level (undeniably more pronounced than the zone of low technologies), the measures must be conceived to overcome the noticed restrictions and to redirect this part of the economy to the expected business trajectory. As the assumption that the level of technical progress of the aggregated parts of industry indicates the predisposition for achieving a certain dynamic of productivity, industrial divisions have been mapped according to the volume and quality of their growth in the period 2016–2021 (the matrix is provided below) in order to detect potential regularities (and deviations from the rules) towards development, depending on their belonging to the mentioned groups by technological intensity.

Table 7. Matrix of technological intensity and performance of volume and quality of growth in manufacturing

Manufacturing divisions aggregated by the technological intensity of the production process	Distribution of economic divisions based on growth volume and quality (2016–2021) ¹		
	QUADRANT I	QUADRANT II	QUADRANT III
<i>High technologies</i>	21 Manufacture of basic pharmaceutical products and pharmaceutical preparations	26 Manufacture of computer, electronic and optical products	
<i>Medium-high technologies</i>	20 Manufacture of chemicals and chemical products 28 Manufacture of machinery and equipment n.e.c. 32 Other manufacturing	27 Manufacture of electrical equipment	29 Manufacture of motor vehicles, trailers and semi-trailers
<i>Medium-low technologies</i>	19 Manufacture of coke and refined petroleum products 23 Manufacture of other non-metallic mineral products 24 Manufacture of other metals 25 Manufacture of fabricated metal products, except machinery and equipment 30 Manufacture of other transport equipment	22 Manufacture of rubber and plastic products 33 Repair and installation of machinery and equipment	
<i>Low technologies</i>	12 Manufacture of tobacco products 17 Manufacture of paper and paper products	31 Manufacture of furniture	10 Manufacture of food products 11 Manufacture of beverages 13 Manufacture of textile 14 Manufacture of wearing apparel 15 Manufacture of leather and related products 16 Manufacture of wood and cork, except furniture; manufacture of products of straw and plaiting materials 18 Printing and reproduction of recorded media

¹ See the distribution of the divisions of manufacturing by quadrants in diagram 4: Labour productivity and economic growth.

The largest part of the activities of high, medium-high and medium-low technologies is situated in the first quadrant based on positive quantitative and qualitative business results. In the section of medium-high technologies, there are companies with pronounced diverging movements as far as productivity is concerned so that it is evident that the realised qualitative indicators could be far more affirmative if through specific measures one could resolve the issue of large companies in which business performance has a descending productivity in the segments outside the first quadrant (in the car industry and industry of electrical equipment), thus diminishing the total efficiency of the section.

All the seven divisions from the zone of medium-low technologies generate a positive production and are relatively well ranked by economic business parameters. However, two economic activities, the manufacture of rubber and plastic products, and the repair and installation of machinery and equipment ensure the growth of the value added with decreasing productivity (respectively, -1.5% and -0.7%, table 6), so that if a turn is made in business efficiency, there is a fear that these divisions drop to the third quadrant, i.e. are unable to maintain positive growth rates on the long-term.

In the group of low technologies, of 10 classified divisions only the manufacture of tobacco products and the manufacture of paper and paper products experienced ascending labour productivity dynamic (on average, annually 1.7% and 0.4%, respectively). However, having in mind their relative importance of 9.4% in GVA and 7.3% in the number of employees in this section, such a growth of labour productivity is insufficient to feel positive tendencies in the whole grouping (the summary result of the entire group is negative both by the trend of the newly created value and by productivity - year-on-year rates of -0.1% and -2.2%, respectively, table 5). In contrast to the mentioned divisions, the manufacture of food products, which by its number of employees and GVA production, has the largest share not only in the group of industries with low technology (49.2% and 46.3%, respectively) but also in the total section of manufacturing (26.9% and 18.3%, table 6), records a continuous fall of productivity in the observed period (except for 2020). Lower efficiency is undoubtedly a warning indicator of changes in production, in this case lagging behind in the implementation of the technical and technological progress, which manifested through an unfavourable dynamic of this activity.

The divisions of low technologies are mainly situated in the third quadrant. Considering that their quantitative and qualitative performances are negative their further growth and development are questionable (thus their survival too) if they follow exclusively the market flow, i.e. if they do not implement appropriate measures. **Although the section on low technology shows globally weaker performances as far as input efficiency is concerned, it would have to have (particularly when knowing that it employs more than half of employees in manufacturing) if not higher business performances, then at least to be outside the zone of negative business performances when it comes to labour productivity.** The third quadrant, besides seven activities from the zone of low technologies, includes only *the car industry*. This division, by the general classification of technological intensity, should as a rule have the prerequisites for a more dynamic rhythm of business productivity, but due to the earlier mentioned restrictions related to the large production concentration, it generates constantly a lower value added per employee, in the period 2016–2021.

Certainly, regardless of the general predisposition determined by the technical and technological level, it is desirable to move all the divisions of industry from the zone of negative business performance, i.e. to systematically tend to have them ranked, by generated performances of efficiency, in the first quadrant of the regression model of integrated qualitative and quantitative results to ensure their stable and long-term sustainable growth.

CONCLUSION

Knowing that manufacturing generates directly almost a fifth of the total gross value added in the country (18.3% on average over 2016–2021), and that due to the influence on the business performance of other activities the implications of its functioning are long-reaching and visible also in the economy in whole as well, it is necessary to pay special attention to the conception of the economic policy in this segment of the economy.

Facing numerous challenges of further economic growth and aiming at taking pace with other more progressive economies, modern society must find new sources of socio-economic development and prosperity. **Unsatisfactory values of qualitative indicators in relation to more developed economies and the fact that an employee in domestic manufacturing is lagging almost four times, by the production of the value added, behind the average of the European Union (by the business efficiency in manufacturing the domestic economy is comparable only with Bulgaria and Romania) indicates without a doubt the deceleration of economic flows in this section** (the section of total manufacturing is situated in the second quadrant by quantitatively positive, but qualitatively negative indicators, which points out possible development restrictions), so that it is necessary to turn to alternative macroeconomic strategies. Opting presently for a certain modality of growth reflects on the potential dynamic of economic growth in the future, thus the presence of socio-economic responsibility is crucial in this process.

As labour productivity is the essential qualitative measure of all economic activities, one needs to work systematically on raising this performance. In fact, this is possible in two ways: 1) by increasing fixed capital per unit of labour based on the increase in investment through the amount of the annual consumption of fixed assets, i.e. by increasing capital input, thus the constant labour input increases the output per unit of labour; and 2) by raising the general level of technical progress, i.e. increasing the output per unit of labour with the implementation of new technologies, i.e. by increasing production effects of invested labour with the same volume of input. In both cases, it is about investment, whether by more intensive capitalisation of the production process or changing the technical structure of capital investments, i.e. by reorienting them towards R&D, innovations, organisational improvements and other forms of technical progress. **Therefore, investments are undoubtedly the final response and key factor in ensuring economic progress and prosperity.**

However, even if investment and productivity are the existential response to all the questions asked to business subjects in manufacturing, the modality and way to achieve stable development tendencies are specific for every activity. **As manufacturing is significantly heterogeneous in its divisions, it is impossible to give one universal, general solution, i.e. it is not desirable to direct unselectively a uniform approach towards all the segments. One needs to review argumentatively the so far effects of the policy of development of each part of the domestic industry.** Impartial quantification of the results of production concentration, the contribution of the technological intensity of a production process, advantages and disadvantages of production concentration (in a broad range from the power that contributes to the acceleration of economic flows to the failed investments) and other tendencies and occurrences from the economic environment of domestic manufacturing can serve as a practical tool for undertaking constructive economic measures. Empirical data, systematised in the previous tables and diagrams, can be used as the starting point to identify and further prioritise the areas of activities in the context of the selected strategy. By mapping the economic potential within manufacturing, the quantitative analysis clearly indicates where dynamic development is more probable and where it generates, with the existing level of technological equipment, higher newly created values, with achievement of economic optimisation. In addition, comparable analysis can help recognise also the potentially significant issues in order to prevent their escalation or repair negative consequences. The trend of qualitative indicators can show in due time serious difficulties faced by a part of the economy (positioning, for example in the third quadrant by unfavourable and quantitative and qualitative indicators), and which cannot be neglected in future development plans. **In order to achieve concrete results it is essential to bring the analysis down to a much lower level of aggregation, particularly in large divisions, such as the manufacture of food** (where there is an evident fall of efficiency, year-on-year -2.5% over 2016–2021), in which every industrial branch faces complex challenges in a specific business environment. With targeted action of systematic policy, harmonisation of regulations and laws, and adequate conception of a package of measures for every activity, it is possible to eliminate considerably the noticed restrictions, promote investment and mobilise entrepreneurial initiative on a broad plan, thus creating a perspective of further development for the activities recognised as priority ones and accelerating the convergence of the whole domestic economic towards more progressive ones.

Even though, owing to increased labour volume, total manufacturing in the second half of the last decade has succeeded in generating positive gross value added, it is scientifically supported and empirically backed up in a large number of cases that the **economic policy followed by smaller qualitative performances is not purposive. Intensive orientation of a considerable part of the newly created value towards the increase in input volume without incorporating technological progress becomes at a certain period of time counterproductive and leads to stagnation due to the exhaustion of resources by extensive growth.** Forcing the quantities of input cannot be by itself a long-term development strategy because it is opposed to the fundamental attitude that the rates of economic growth are conditioned by its quality. Therefore, in the context of development processes, one must include productivity as an all-inclusive, and often, the only meritorious indicator of business efficiency and effectiveness of the current strategic orientation.



REMARK

Having in mind that for the calculation of labour productivity one has used data on gross value added compiled by the national accounts, it is recommended to use the data on employment, also calculated in compliance with the methodology of national accounts. It is worth mentioning that the consistency of the calculation of all variables in the national accounts (such as output, GVA, salaries and wages, etc.) and derived indicators is ensured by using the same sources, i.e. corresponding calculation methods. Otherwise, it may happen in certain cases (e.g. by using data on employment from annual statements and GVA from the national accounts) to obtain a wrong picture of an economic occurrence (it is even possible to obtain data on productivity trends with different signs)).

The main difference in the number of employees by the concept of the national accounts in relation to the number of employees from annual statements of business subjects is in the coverage, from two aspects: 1) by national accounts concepts, besides enterprises entrepreneurs are also covered, i.e. employees employed by entrepreneurs; 2) annual statements cover formal employees, i.e. registered employees, while the national accounts concept includes also informal employees, i.e. unregistered employees (as a result of exhaustivity of calculation).

To obtain the number of employees by the national account concept two data sources are used – Central Register of Compulsory Social Insurance (CRSI) and LFS. LFS data are used as the measure of total, i.e. total employment, while CRSI data are used as the measure of formal employment. The difference between the total number of employees according to LFS and formal employees according to CRSI represents informal employment. To distribute formal employment by activities CRSI data are used. As far as informal employees in business entities (legal entities) are concerned, they are distributed to activities by the employment structure of micro-enterprises (enterprises with 1–5 employees according to annual statements), in which the largest part of unregistered employees is concentrated. Informal employees in entrepreneurial businesses are distributed to activities according to the structure of formal employment (according to CRSI) in entrepreneurial business. In contrast to large enterprises (e.g. *EPS*, *NIS*) one uses data on employees by local units, obtained directly from these enterprises. As far as self-employed persons are concerned (individual agricultural producers, owners of entrepreneurial businesses, employees “on contract” and other self-employed) LFS data are used. In contrast to LFS, which does not include, according to the new methodology, farmers producing exclusively for their own consumption, this category of farmers is included in employment according to the national account concept, and this represents the most important difference in relation to LFS. At the end of the calculation, other adjustments are made by activities. For example, based on the data of the Census of Agriculture, one part of agricultural producers is shifted into the food industry (because they process primary products). In addition, the estimated number of persons performing illegal activities (e.g. prostitution, production of narcotics) is added to total employment.



MODERN TRENDS OF DEMOGRAPHIC TRANSITION IN SERBIA

The transitional demographic balance indicates the presence of complex demographic problems that Serbia has been facing in recent decades. Unfavorable conditions include natural and mechanical movement of the population that directly affects the reduction of the total number of inhabitants, changes in the age structure and the creation of regional disproportions. The heterogeneity of the spatial-demographic character in Serbia is particularly noticeable between urban and rural settlements. Urban areas generally achieve demographic growth thanks to the mechanical influx of population and a more favorable age structure, so they assume a leading role in population reproduction. On the contrary, in rural areas there is a weaker demographic growth, which is mainly conditioned by emigration and disorders of a biological character. Although temporary in nature, the coronavirus pandemic contributed to the additional demographic collapse to a significant extent.

Demographic transition is a shared demographic experience of European and other developed countries of the world and is reduced to the transformation of high mortality and fertility rates to low rates, that is, to the reduction of both mortality and fertility.

Insufficient birth rate characterizes contemporary demographic trends that began in European countries, and during the second half of the 20th century they became a feature of developed and developing countries with the adoption of low reproductive standards.

Understanding the trends and causes of the demographic transition allows us to manage it more easily, face its consequences and thus prepare for the future.

It is also important to note that current demographic trends do not affect every country and every region in the same way. For example, despite the fact that the European population is aging as a whole, demographic trends are far from uniform, with significant variations between and within individual EU member states. Population decline was particularly present in certain eastern EU member states, which experienced a high level of emigration, as well as in populations moving within their home countries from rural regions to predominantly urban areas in search of better work and educational opportunities. Demographic differences, as a consequence of such developments, can worsen existing economic, social and territorial inequalities, but also cause political divisions.

Although demographic changes occur over a long period of time, sudden events such as the coronavirus pandemic and the war in Ukraine can accelerate or disrupt established patterns. In some cases, such disturbances are transitory, while in others they can have a lasting impact on demographic changes.

However, apart from the obvious consequences and challenges, the demographic transition has also brought certain benefits. The fact that people today live longer and healthier lives than previous generations is in itself a remarkable social achievement. As the labour market is flexible, it also provides more opportunities for active aging and continuous personal development. On the other hand, despite the existing gender differences, more and more women participate in the labour market.

DEMOGRAPHIC DECLINE (REGRESSION) IN SERBIA

In recent decades, the Republic of Serbia has been characterized by a distinct demographic decline (demographic regression). In the last inter-census period (from 2011 to 2022), the development of the population of the Republic of Serbia recorded very unfavourable tendencies, which are reflected in the deepening of three global demographic processes: (1) total depopulation (decline in the number of inhabitants); (2) natural depopulation (the number of deceased residents exceeds the number of live births) and (3) demographic aging. The aforementioned processes are particularly pronounced at the regional level, so it can be said that the Republic of Serbia is characterized by a noticeable urban-rural population polarization.

The pronounced demographic heterogeneity of the territory of the Republic of Serbia was also reflected in the changes in the total number of inhabitants. Negative trends in the movement of the total population of Serbia are indicated by the data of the last census, in 2022 (6 647 003 inhabitants), which record a decrease of the number of inhabitants compared to the previous census (by 539 859 inhabitants or 7.5%). The number of inhabitants in 2022 is close to the level recorded by 1961 Census.

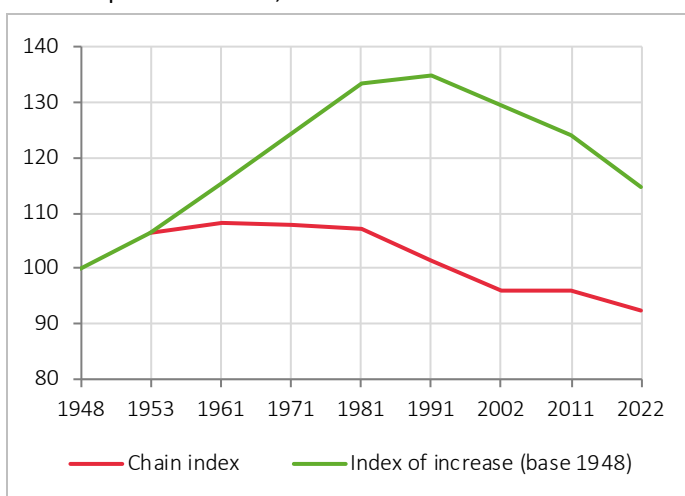
Table 1. Population growth – decline of the Republic of Serbia, 1948–2022

Year	Number of inhabitants ¹	Chain index (previous year=100)	Growth index (1948=100)
1948	5 794 932	-	100.0
1953	6 163 246	106.4	106.4
1961	6 678 239	108.4	115.2
1971	7 202 898	107.9	124.3
1981	7 729 236	107.3	133.4
1991	7 822 795	101.2	135.0
2002	7 498 001	95.8	129.4
2011	7 186 862	95.9	124.0
2022	6 647 003	92.5	114.7

Source: SORS

¹ Without data for K & M

Chart 1. Population growth and decline of the Republic of Serbia, 1948–2022



Observed by regions, in the last intercensal period, only Belgrade region recorded growth (1.3%), while the largest demographic discharge was experienced by Šumadija and Western Serbia Region (-10.5%), whereof the remaining two regions recorded almost the same discharge (about -10%). At the regional level, the lowest population growth rates were recorded in North Banat (-20.2%) and Zaječar (-19.4%) divisions, while only Belgrade region had an increase (1.3%). As many as 116 municipalities recorded a decrease in the number of inhabitants greater than -10%. The largest depopulation was recorded in the municipalities of Crna Trava (-36.1%) and Gadžin Han (-30.3%), followed by Rekovac, Babušnica and Bosilegrad with a drop of more than 25%. At the same time, these municipalities record the highest share of single households in the total number of households, namely Crna Trava - 48.5%, Gadžin Han - 38.9% and Babušnica - 38.8%. On the other hand, the largest share of households with five or more members in the total number of households have: Preševo (47.3%), Bujanovac (38.6%), Tutin (30.5%), Sjenica (27.4%) and Novi Pazar (26.6%).

SPATIAL-DEMOGRAPHIC DIVISION (TYPOLOGY) OF THE MUNICIPALITIES OF SERBIA

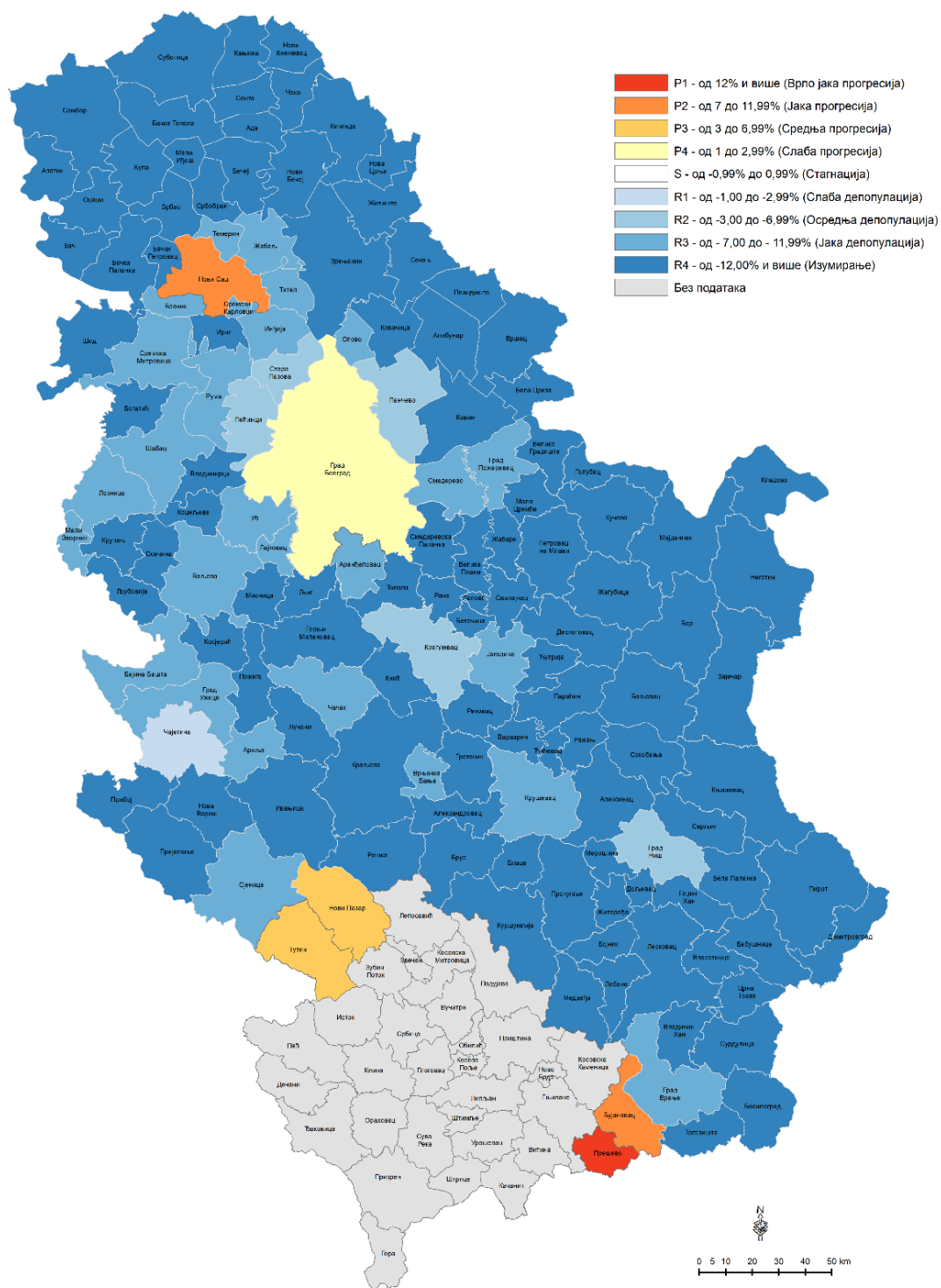
The intensity of regional differences is best illustrated by the categorization of areas in accordance with the change in the number of inhabitants in the intercensal period 2011–2022. According to the intensity of the inter-census change in the number of inhabitants, four progressive (P) and four regressive type (R) areas can be distinguished¹³. Depending on the relative size of the population change, progressive types are: very strong progression (P1), strong progression (P2), medium progression (P3) and weak progression (P4), while regressive types are: weak depopulation (R1), medium depopulation (R2), severe depopulation (R3) and extinction (R4).

The largest number of municipalities in Serbia belongs to a category of regressive (depopulation) type, namely type R4 (106 municipalities), which is characterized by demographic extinction, and then also type R3 (27 municipalities), which reflects areas of strong depopulation, requiring a special scenario of development support. The characteristic is that the zones of demographically endangered areas expand and form relatively compact and spatially large depopulated areas in the eastern, western and southwestern parts of Serbia, but also in the immediate vicinity of the largest urban agglomerations in the Republic.

The progressive type mainly includes areas with a pronounced concentration of population, on which internal migrations (local and regional migrations) had a decisive influence, as a result of which strong population potentials were formed. The municipalities of Preševo (P1), Bujanovac (P2), Novi Pazar (P3), Tutin (P3), Novi Sad (P2) and Belgrade (P4) belong to the progressive type of area.

¹³ Ivo Nejašmić "Demo geography - population in spatial relations and processes", Zagreb, 2005.

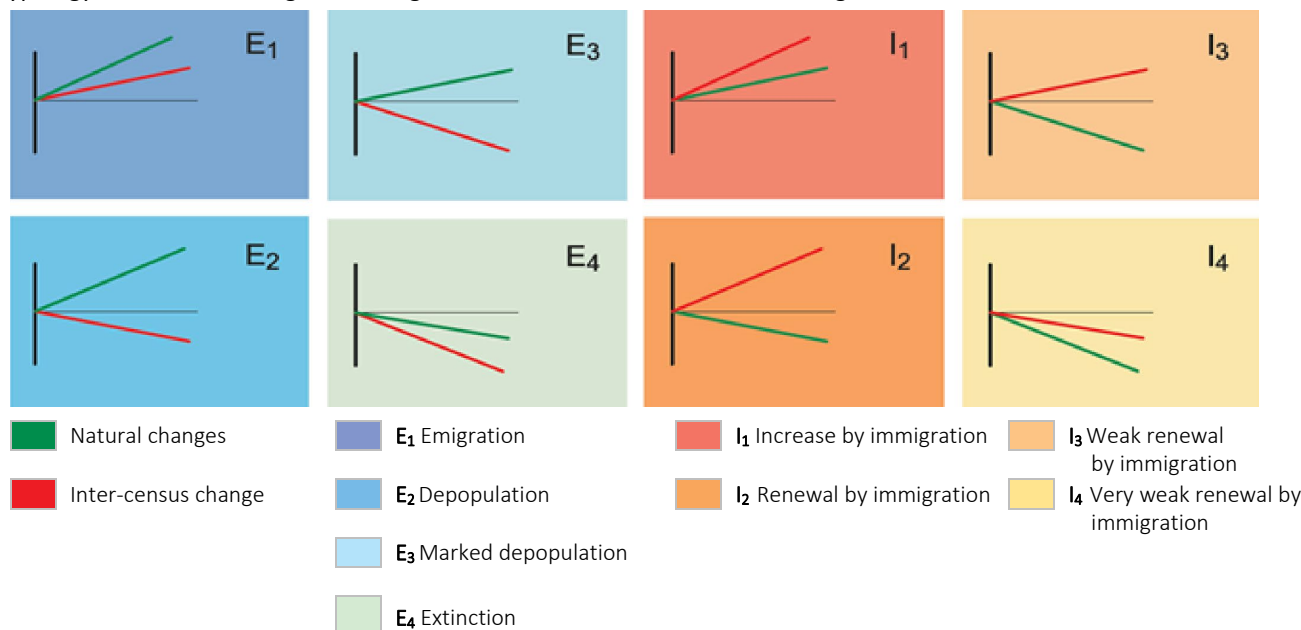
Map 1. Typology of municipalities according to the size of the change in the number of inhabitants in the intercensal period 2011–2022



Графичка подлога: Републички геодезски завод
Урађено у Републичком заводу за статистику

However, for a better understanding of the dynamic characteristics of the population, it is necessary to define and analyse more complex indicators (not only the inter-census change), which give a more detailed picture of a certain geographical area and the analysed period. This aspect of the analysis includes types of overall population movement that show the relationship and impact of natural and mechanical changes in a certain period. Depending on whether the migration balance is positive or negative, it is determined whether a certain geographical area is characterized by emigration (E) or immigration (I). The types are determined according to the intensity of migration characteristics and whether the natural change is positive or negative¹⁴.

Typology of areas according to the magnitude of natural and intercensal changes in the number of inhabitants



The types of population movements separated in this way in the inter-census periods show the spatial aspects of transitional trends in the formation and distribution of total population potentials, achieved by the transformation levels of natural renewal, on one hand, and population migration, on the other.

The transitional trends of the types of population dynamics in Serbia are manifested through the territorial expansion of the most demographically threatened areas affected by population extinction (E₄), with increasingly clear differentiation of areas characterized by immigration types of population movement. In the last intercensal period (2011–2022), 90.6% of municipalities had an emigration (exodus) character, that is, they had a trend of extinction.

This synthetic demographic indicator at the regional level presents a reflection of the previous long-term demographic processes, which were reflected on the characteristics of the overall movement of the population in the last inter-census period.

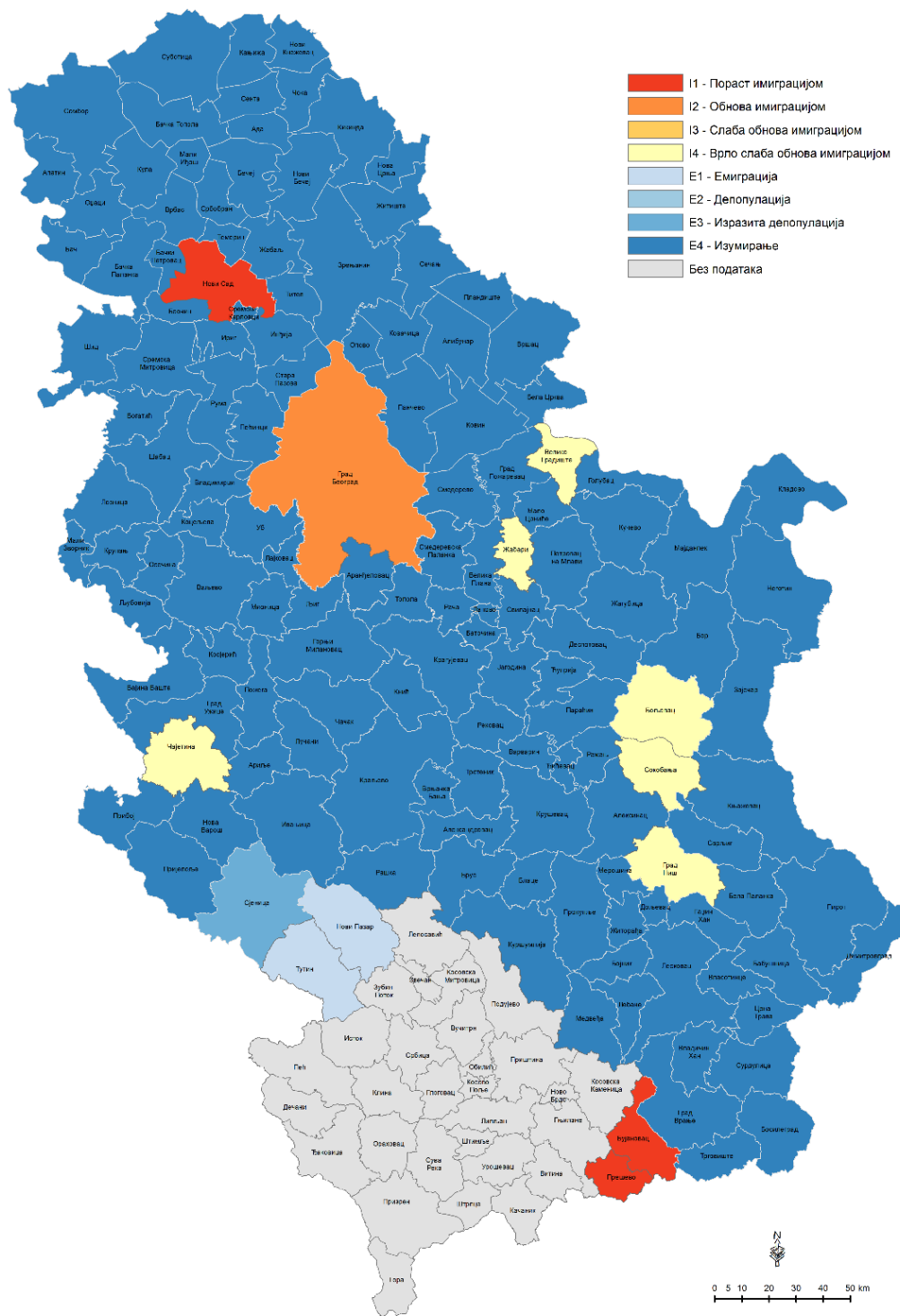
Table 1. Inter-census movement of the population of the Republic of Serbia

	1971–1981	1981–1991	1991–2002	2002–2011	2011–2022
Population growth/decline	526 000	93 500	-83 436	-377 335	-539 859
Natural increase	397 000	177 400	-189 875	-316 493	-459 300
Migration balance	129 000	-83 900	106 439	-60 842	-80 559

After comparing the basic components of population growth in inter-census dynamics, it is not difficult to state that the total natural increase in Serbia is, in the period 1981–1991, double smaller compared to the previous inter-census period (drop from 397 000 to 177 400), while starting from the period 1991–2002. records worrying values with a negative sign.

¹⁴ Depending on the ratio of indicators of natural movement and migration balance, each group has 4 subtypes (E₁ - emigration, E₂ - depopulation, E₃ - marked depopulation, E₄ - extinction; I₁ - increase by immigration, I₂ - renewal by immigration, I₃ - weak renewal by immigration and I₄ - very weak renewal by immigration).

Map 2. Typology of municipalities according to the magnitude of natural and mechanical changes in the number of inhabitants in the intercensal period 2011–2022



AGING OF THE POPULATION OF SERBIA

Decades of unfavourable trends in the natural and mechanical movement of the population have left their mark on the age structure, through the acceleration of the population aging process.

According to all characteristics, the population of Serbia can be classified into a group of extremely old populations. The share of young people is low and with a tendency to further decline, while the share of old people is high and constantly growing.

In the period 2011–2022, the participation of people over 65 increased from 17.4% to 22.1%. In the same period, the average age of the population increased from 42.1 to 43.8 years.

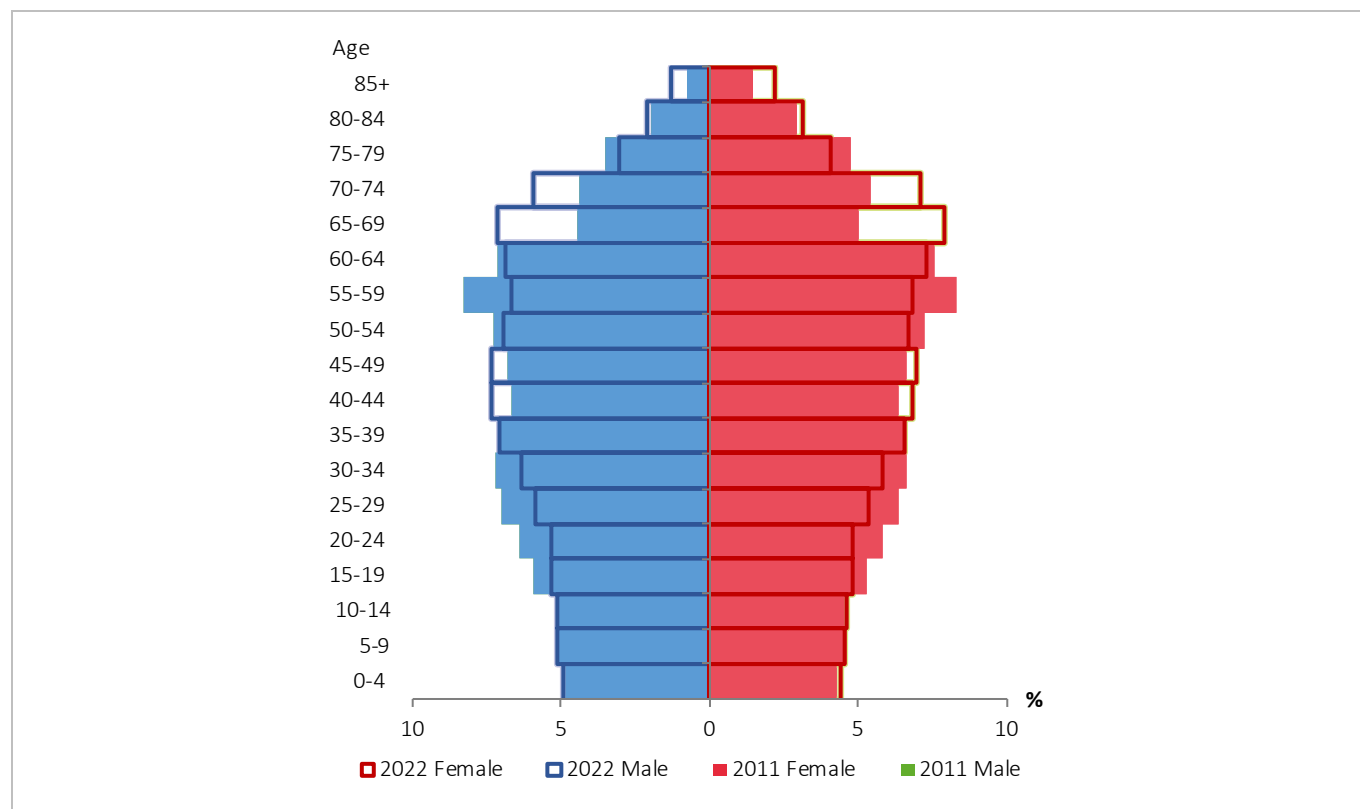
Moreover, the shape of the age pyramid indicates the fact that the age structure of the Serbian population has all the characteristics of the so-called *regressive type* (narrowed basis). Existing tendencies are also illustrated by the growing trend of the aging index (the ratio of the old to the young population), which in Serbia has long exceeded the threshold value (40 old people per 100 young people) with a tendency of further growth (from 124.6 in 2011 to 150.1 in 2022). Also, the *dependency index of the elderly* – the ratio of the population over 65 years of age and the working-age population (15–64) – recorded an increase of 9.3 p. p. in the period 2011–2022.

The coronavirus pandemic had a visible, but mostly transient impact on the aforementioned demographic trends.

After a moderate but continuous increase in life expectancy in Serbia (from 74.7 in 2012 to 75.7 in 2019), for a two-year period during the coronavirus pandemic, life expectancy is three years shorter, with 73.1 to 70 for men and from 78.3 to 75.6 years for women, after which it goes on an upward trajectory and in 2022 the life expectancy of the male population reaches 72.9, and 78.1 for the female population.

Similar trends are recorded in the EU member states. The pandemic was responsible for a sharp increase in mortality in 2020–2021, and as a result, life expectancy fell from 81.3 years in 2019 to 80.1 years in 2021.

Chart 2. Age-sex structure of the population of Serbia, 2011–2022



Future trends in the demographic development of Serbia indicate the inevitability of a significant acceleration of the aging process. This will inevitably affect lower territorial units such as municipalities. With great certainty, an increasingly unfavourable age structure of the population of the municipalities can be expected, and if the current trends continue in the municipalities with the deepest demographic age, in the near future their demographic "shutdown" could be expected.

The results so far have shown that changes in demographic development and regional differences are not the result of unequal ethnic composition, but of historical and socio-economic conditions in which demographic development takes place.

DEMOGRAPHIC PERSPECTIVE OF SERBIA

In order to achieve the sustainable demographic development of Serbia, the priority is to increase the natural increase. However, in order to reach the predicted stationary stage of population, and in order to compensate for the previous losses, the level of reproduction would initially have to be above the level required for the simple renewal of the population, while it should be borne in mind that changes in this area do not occur suddenly or spontaneously. The role of the state and local self-government in solving these problems is significant. On the example of some European countries, it can be seen that the most effective measures are financial support for the family and help in harmonizing business and parental obligations.

The Government of the Republic of Serbia recognized demographic changes as a priority and with financial measures of the population policy contributed to the interruption of the decade-long trend of declining birth rates (520 more live births in 2022 compared to the previous year), which is a significant advance, but it is still too early to draw long-term conclusions. Certainly, the implementation of effective population policy measures and the provision of support to young couples should be continued in order to maintain the positive trend.

Other strategic goals of the population policy include encouraging internal migrations that would lead to a more even spatial distribution of the population, eliminating factors that lead to "brain drain", continued growth in life expectancy, but also respect for aging in all aspects.

1. MACROECONOMIC FORECASTS

The developed SORS system of leading composite indicators in, on average, one to two quarters at most ahead of economic cycles. When combined with econometric models, it allows making a quantitative evaluation of the dynamics of the growth rate of economic activity in the short term. The family of leading indicators by sections and corresponding forecasts are presented below.

1.1. FORECAST OF CONSUMER PRICE TRENDS¹⁵ FOR Q4 2023.



Chart 1.1. Comparison of the cycle of the SORS leading indicator of consumer prices (SORS CPI) and total consumer prices in the Republic of Serbia, detrended and standardised data, deviation from the average for the period, Q1 2007 – Q4 2023 (%)

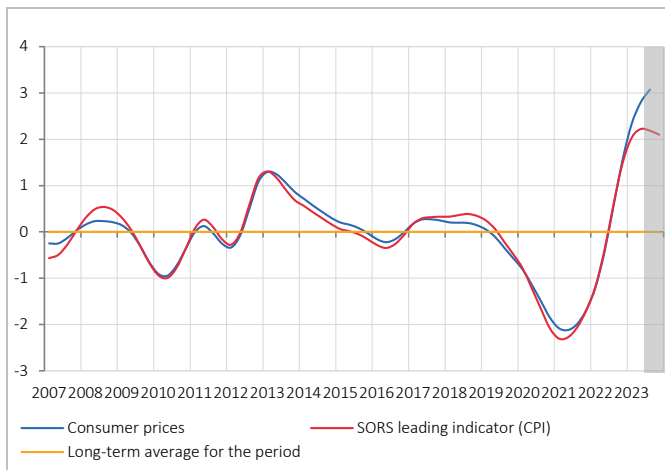
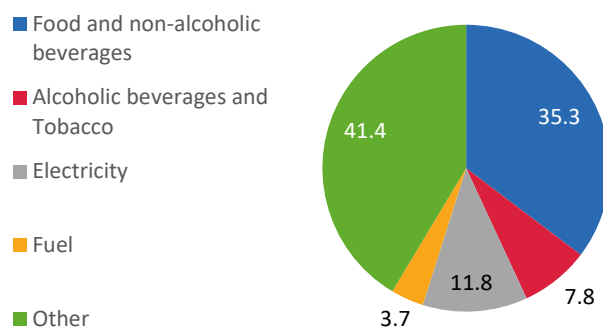


Chart 1.2. Structure of forecast year-on-year consumer price growth rate, Q4 2023 (total 100) (%)



¹⁵ The leading SORS consumer price indicator (SORS CPI) is a result of a research and analytical work by the SORS. The indicator consists of the coverage of previously developed composite food price indicators (IPC-H, i.e. CPI – F), fuel price (IPC-G,, i.e. CPI-F) and tobacco price (IPC-D, i.e. CPI-T), as the largest generators of inflation on the long-term. Taking into account the considerable change in the structure of consumer prices when generating the year-on-year growth rate (primarily, the significant growth of the influence of its energy component starting from the second half of 2022), the SORS consumer price indicator (SORS CPI), the existing long standing biggest strategic elements of consumer price growth (food , tobacco and fuels for passenger cars), has been modified by directly including additional factors of price growth of electricity, gas and solid fuels.

It has been announced that the excise on fuels, cigarettes and tobacco products, alcoholic beverages and coffee will increase by 8.0% in Q4 2023, for each of these items respectively. Also, in the beginning of 2023 it was agreed under the IMF arrangement that the prices of electricity for households would increase in November (in addition to the already realised increase in January and May) of 8.0% (and of about 10.0% for gas). By imputing these announced changes in excises in the model of the leading indicator of consumer prices in Q4 2023 a year-on-year growth of consumer prices of about 9.0% has been forecast, thus the average inflation of consumer prices in the entire 2023 would be maintained at the level of about 13.0%. The extraordinary growth of excises on cigarettes (8.0%) in October 2023 will contribute to the average growth of the prices of cigarettes by 7 dinars, a growth of 1.8% in relation to Q3 2023 and of 7.8% in relation to Q3 2022. The growth of the excises on alcoholic beverages will augment most their current contribution from Q3 2022, at most by about 0.1 pp. The conclusion is that the largest influence on year-on-year price growth in Q4 2023 will still be generated by the growth of electricity prices, but according to its influence, compared with the previous quarters, it will not be much ahead to the price of tobacco and alcoholic beverages, and fuels.

Chart 1.3. Movement of fuel prices in Serbia and producers' prices of agricultural and fishing products of Serbia, seasonally adjusted, detrended and standardised data, deviation from the average for the period, Q1 2007 – Q2 2023 (%),

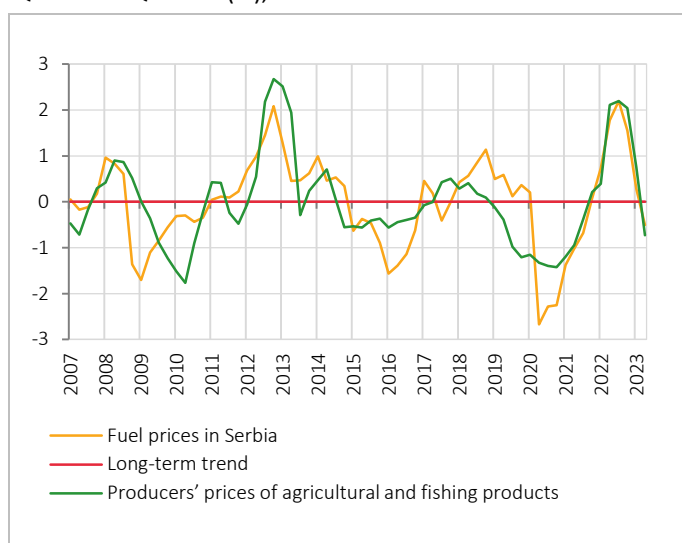
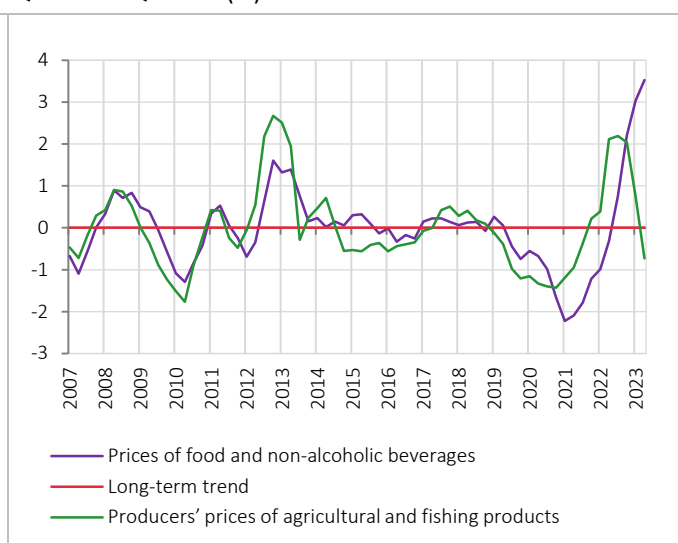


Chart 1.4. Movement of the prices of producers' costs for agricultural and fishing products and food prices in Serbia, seasonally adjusted, detrended and standardised data, deviation from the average for the period, Q1 2007 – Q2 2023 (%)



SORS empirical analysis confirmed that the prices of *BRENT* crude oil on the world market are about one month ahead of fuel prices in Serbia. The analysis the excise calendar and comparison with fuel prices in Serbia indicate visibly that fuel prices depend mostly on the price of crude oil, thus they do not obligatorily grow due to the increased excises. This means that a potential growth (fall) of the price of *BRENT* crude oil in the current month leads, on average, to the growth (fall) of fuel price in Serbia in the following month. Therefore, if until the end of September 2023 (or even October) the price of *BRENT* crude oil on the world market will experience fall, the inflationary effect of the announce growth of excises on the retail price of diesel and gasoline could happen in October (i.e. November).

On the hand, the analysis confirms that the growth of fuel price in Serbia in the same quarter generates the growth of producers' prices of agricultural and fishing products, while the latter are ahead one quarter of food prices. Every disparity of this longstanding rule shows best the influence of sale margins in consumer price trends.

This means that potential inflationary effects of the growth of fuel prices in the months of Q4 2023 on the prices of food and beverages would be manifest only starting from Q1 2024.

1.2. FORECAST OF INDUSTRY GVA TRENDS

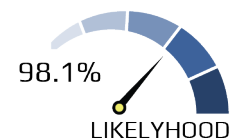


Chart 1.5. Comparison of the cycle of the leading indicator INDIPAS and industry physical volume, seasonally adjusted, detrended, leveled out and standardised data, deviation from the average for the period, Q1 2001 – Q3 2023 (%)

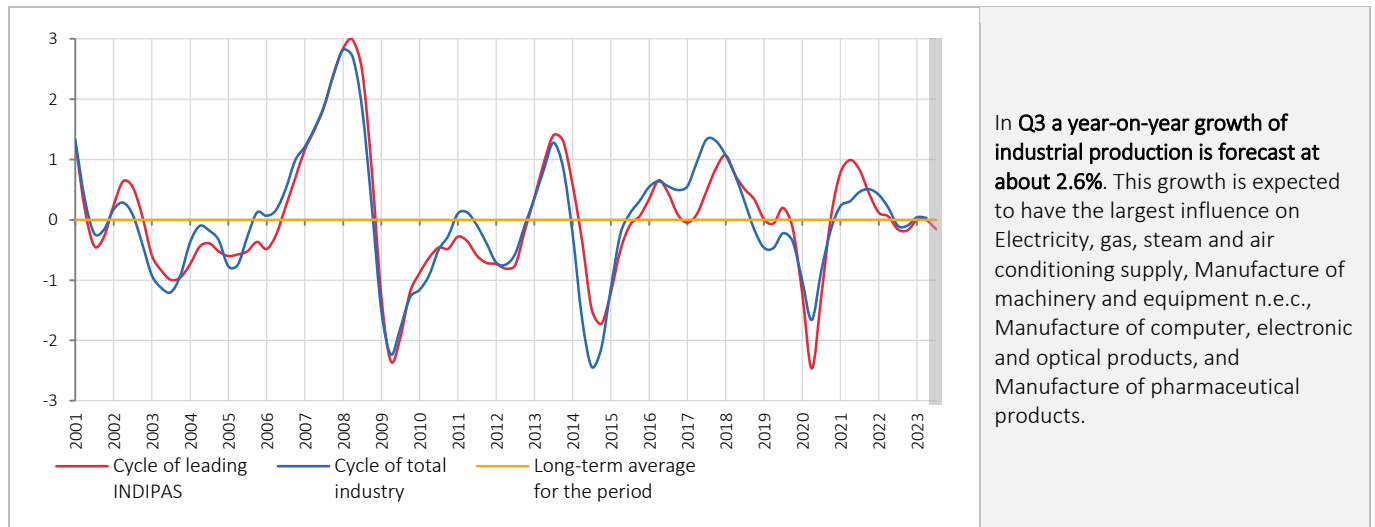


Chart 1.6. Comparison of the realised and forecast annual industry GVA growth rates (%)

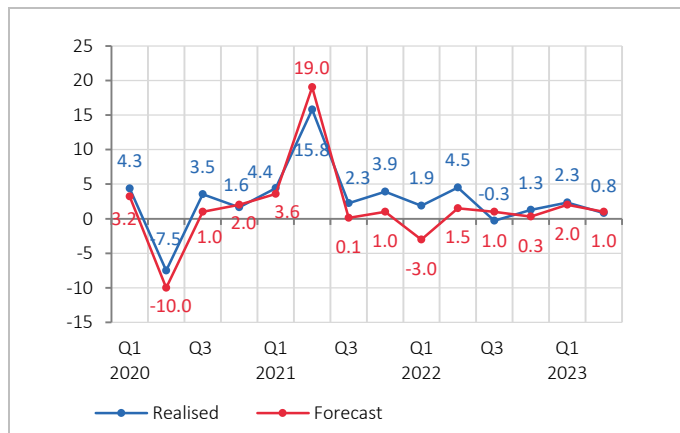
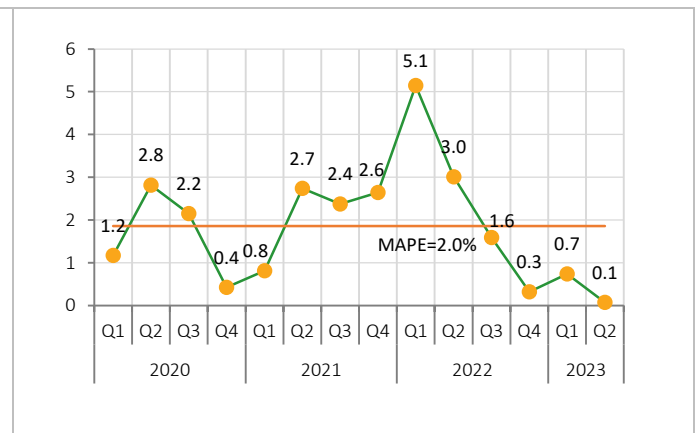


Chart 1.7. Mean Absolute Percentage Error - MAPE)¹⁶, forecasts of industry GVA growth, Q1 2020 – Q2 2023 (%)



¹⁶ Mean Absolute Percentage Error – MAPE is a measure of the simplified interpretation an error of a forecasting model in statistics. It is defined as the ratio

$$MAPE = \frac{100\%}{n} \sum_{t=1}^n \left| \frac{A_t - F_t}{A_t} \right|$$
, where A_t is the real value, and F_t the forecast value. Their difference is divided by the real value A_t . The absolute value of this ratio is added up for each forecast point in time and divided by the total number of time points n . **The relative deviation of the real values from the forecast ones by (+/-) 5% has been determined by the interval limit of validity of the given forecast (95-percentage indicator reliability interval), which we have defined after having derived MAPE as the likelihood of the model by the formula ($v=100-(MAPE)$) expressed in percentage.** Absolute values are non-negative values. The forecast values in the chart were published in the previous issues of *Trends*.

1.3. FORECAST OF SERVICE GVA TRENDS

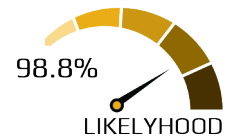


Chart 1.8. Comparison of the cycle of the leading service indicator and service GVA, seasonally adjusted, detrended, leveled out and standardised data, deviation from the average for the period, Q1 2006 – Q3 2023 (%)

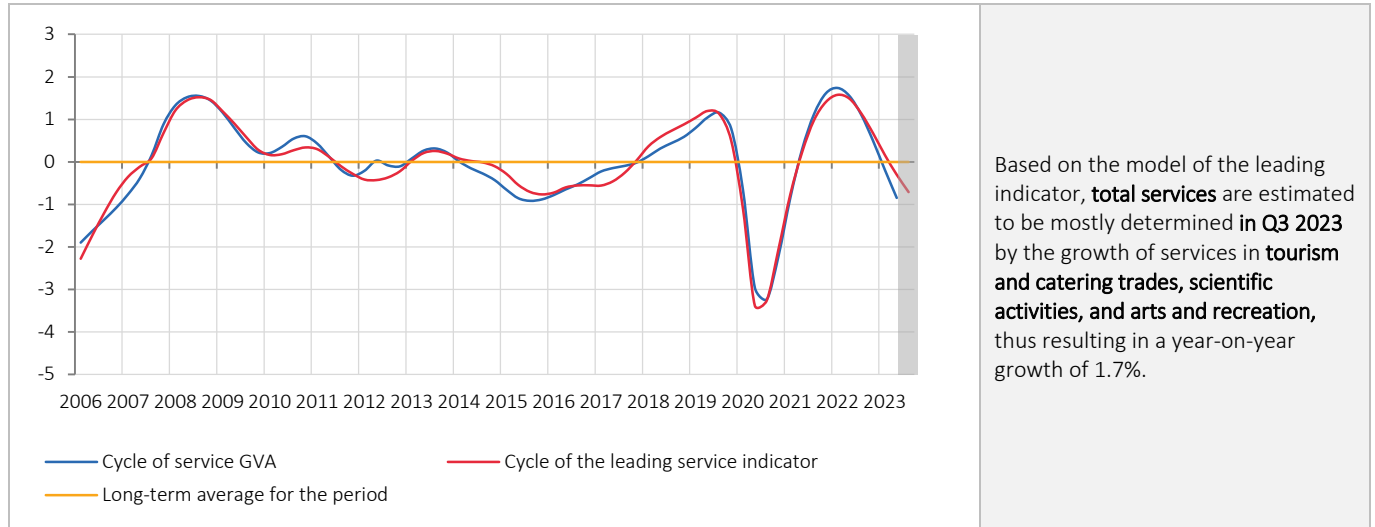


Chart 1.9¹⁷ Comparison of the realised and forecast annual service GVA growth rates (%)

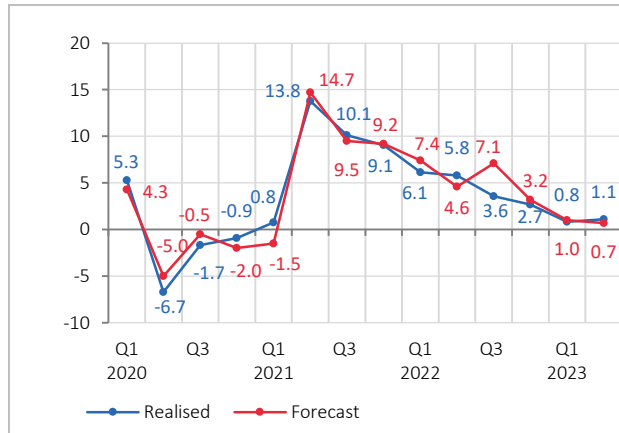
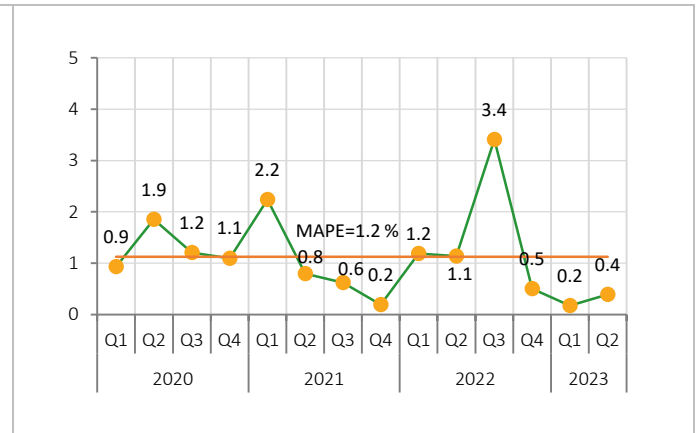
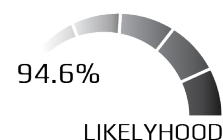


Chart 1.10. Mean Absolute Percentage Error - MAPE, forecasts of service GVA growth, Q1 2020 – Q2 2022 (%)



¹⁷ Forecast values mentioned in the chart are always published one quarter before the realised data are available, and are presented in the previous issues of *Trends*.

1.4. FORECAST OF CONSTRUCTION GVA



The year-on-year construction GVA growth in the first six months of 2023 of 7.4% was mostly affected by the activities on the construction of the **transport infrastructure** (modernisation of the railway Belgrade - Novi Sad; Morava Corridor, highway Belgrade - South Adriatic (section Preljina - Pozega); highway Ruma-Sabac-Loznica and Fruska gora Corridor), **pipelines, communications and electrical power lines** (construction of the municipal and sewage infrastructure under the project "Clear Serbia" and gasification Belgrade-Valjevo-Loznica) and by a considerable growth of the construction of buildings (particularly in Q2 2023).

By applying the SORS forecast model, in Q3 2023 construction GVA is expected to experience a growth of about 20.8%.

Table 1.1. Structure of the contribution to the annual construction growth rate

	2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Construction GVA, annual growth rate, % (1+2)	19.8	18.3	19.4	14.4	-5.7	-6.9	-12.1	-12.5	-1.4	15.1	-	-
1. Buildings, pp. (1a+1b)	13.4	7.2	5.3	5.8	-5.2	-2.6	-6.4	-4.4	-10.1	5.2	-	-
<i>1a. Residential buildings</i>	<i>10.4</i>	<i>3.7</i>	<i>1.1</i>	<i>-0.1</i>	<i>-5.9</i>	<i>-1.5</i>	<i>-2.0</i>	<i>-0.1</i>	<i>-3.4</i>	<i>3.0</i>	<i>-</i>	<i>-</i>
<i>1b. Non-residential buildings</i>	<i>3.0</i>	<i>3.6</i>	<i>4.2</i>	<i>5.8</i>	<i>0.7</i>	<i>-1.1</i>	<i>-4.3</i>	<i>-4.4</i>	<i>-6.7</i>	<i>2.2</i>	<i>-</i>	<i>-</i>
2. Other buildings, pp. (2a+2b+2c+d)	6.4	11.0	14.1	8.7	-0.4	-4.2	-5.8	-8.1	8.7	10.0	-	-
<i>2a. Transport infrastructure</i>	<i>1.1</i>	<i>13.9</i>	<i>14.3</i>	<i>12.9</i>	<i>4.4</i>	<i>-1.8</i>	<i>-2.7</i>	<i>-6.2</i>	<i>10.9</i>	<i>5.8</i>	<i>-</i>	<i>-</i>
<i>2b. Pipelines, communication and electric power lines</i>	<i>2.9</i>	<i>-4.5</i>	<i>1.4</i>	<i>-2.3</i>	<i>-5.5</i>	<i>-2.4</i>	<i>-3.8</i>	<i>-3.6</i>	<i>0.8</i>	<i>4.3</i>	<i>-</i>	<i>-</i>
<i>2c. Complex construction on building sites</i>	<i>2.2</i>	<i>1.8</i>	<i>-0.5</i>	<i>-2.5</i>	<i>0.0</i>	<i>-0.1</i>	<i>1.0</i>	<i>2.0</i>	<i>-1.5</i>	<i>0.3</i>	<i>-</i>	<i>-</i>
<i>2d. Other civil engineering, not elsewhere classified</i>	<i>0.3</i>	<i>-0.1</i>	<i>-1.2</i>	<i>0.5</i>	<i>0.8</i>	<i>0.0</i>	<i>-0.3</i>	<i>-0.3</i>	<i>-1.4</i>	<i>-0.5</i>	<i>-</i>	<i>-</i>
Contribution to construction GVA growth rate, pp.	0.8	1.0	1.1	1.0	-0.3	-0.4	-0.8	-0.9	-0.1	0.8	-	-

Chart 1.11. Comparison of the realised and forecast¹⁸ annual construction GVA growth rates (%)

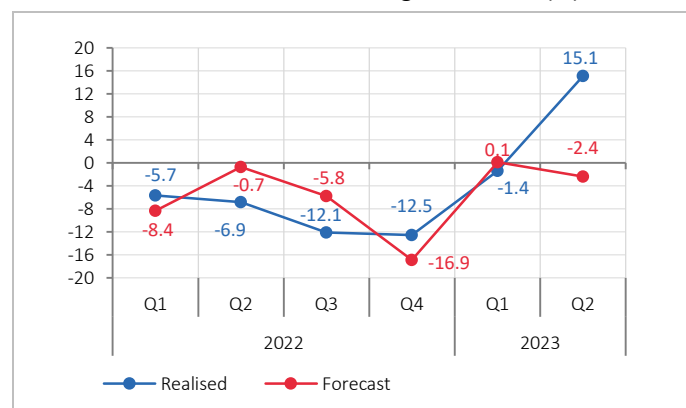
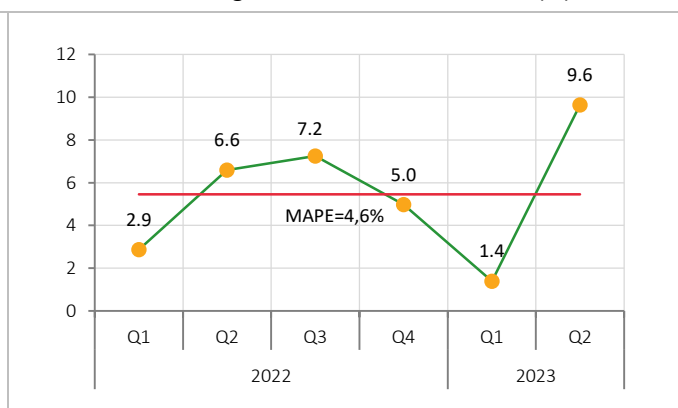
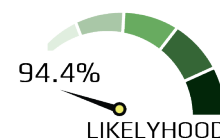


Chart 1.12. Mean Absolute Percentage Error - MAPE), forecast of construction GVA growth, Q1 2020 – Q2 2023 (%)



¹⁸ The forecast data presented in graph 1.11 was obtained by simulating the forecast based on the returned sample from Q1 2022 (by successively repeating the forecasting procedure after each "new" data of the leading indicator of construction activity SORS GRIPAS). Only the data for Q4 2022 was officially published in the previous (December 2022) issue of Trends.

1.5. MODEL OF AGRICULTURE FORECAST – SYSTEM AGRIPAS¹⁹ („May scenario“)



By applying the system AGRIPAS (model of crop and livestock production), and based on preliminary and estimated parameters of both models in the so-called **September scenario**, the year-on-year agriculture GVA growth rate is estimated at **about 13.0%** for 2023. In 2023, GVA of crop production is expected to go up by about 18.0%, and livestock production to go down by about -2.0%. Based on the obtained results of the **September scenario** of the AGRIPAS model, the contribution of the agriculture GVA to the annual GDP growth rate in 2023 would be approximately 0.9 pp.

Table 1.2. Comparison of the forecast and realised agriculture GVA growth rates

Year	Forecast - May scenario	Forecast – September scenario	GVA of agriculture, forestry and fishing, according to SORS statistical releases, %	Relative deviations of the May scenario from the output, %	Relative deviations of the September scenario from the output, %
2018	12.8	16.5	15.1	-2.0	1.2
2019	-3.8	-2.3	-1.7	-2.2	-0.7
2020	1.5	2.3	2.3	-0.7	0.1
2021	1.2	-1.5	-5.7	-7.0	-4.1
2022	6.5	-4.9	-8.3	16.1	3.7
2023	15.0	13.0	-	-	-

⚠ Remark: The relative deviation of the forecast value from the realised one by (+/-) 5% is the interval limit of validity of a given forecast (95-percentable likelihood of the indicator). The forecast values listed in the table are published in the previous issues of *Trends*. The final projection of agriculture GVA in 2022 will be finished in September 2022 („September scenario“) by publishing the AGRIPAS results, based on the realised inputs of the model, when we will also form the interval of the agricultural production and its final impact on GDP. Once the final data are published, we will check the efficiency of the forecast assumptions and the results of the first May forecast.

1.6. SUMMARY OF OBTAINED RESULTS OF THE FORECAST OF LEADING INDICATORS BY GVA SECTORS FOR Q3 2023

Table 1.3. Forecast of GVA of selected sections and their estimated contribution to GDP, Q3 2023

Q3 2023	Agriculture	Net taxes	Industry	Construction	Services
Quarterly growth rates, %	13.0	0.6	2.6	20.8	1.7
Contribution to the growth rate of GDP (pp.)	0.8	0.1	0.5	1.2	0.9

¹⁹ The model of crop production includes separate modeling of the production of wheat and maize, taking into account the factors of rainfalls in sowing periods as well as in periods of generative phases – from tillering, accelerated growth up to the phase of grain filling for wheat and maize, the estimate of harvesting areas, variables of drought years of crops, the indicators of soil humidity (standardised rainfall index and Palmer Z index). The results of the estimates of agriculture trends, which are based on the model of crop production, will be given in the May and September scenarios, when it will be approximately possible to obtain final agriculture results and their quantitative influence on GDP growth rate in the current year. The model of livestock production is based on the structural model of livestock increase and model of primary livestock products (which mostly depends on the results of the model of milk production).

2.

GROSS DOMESTIC PRODUCT

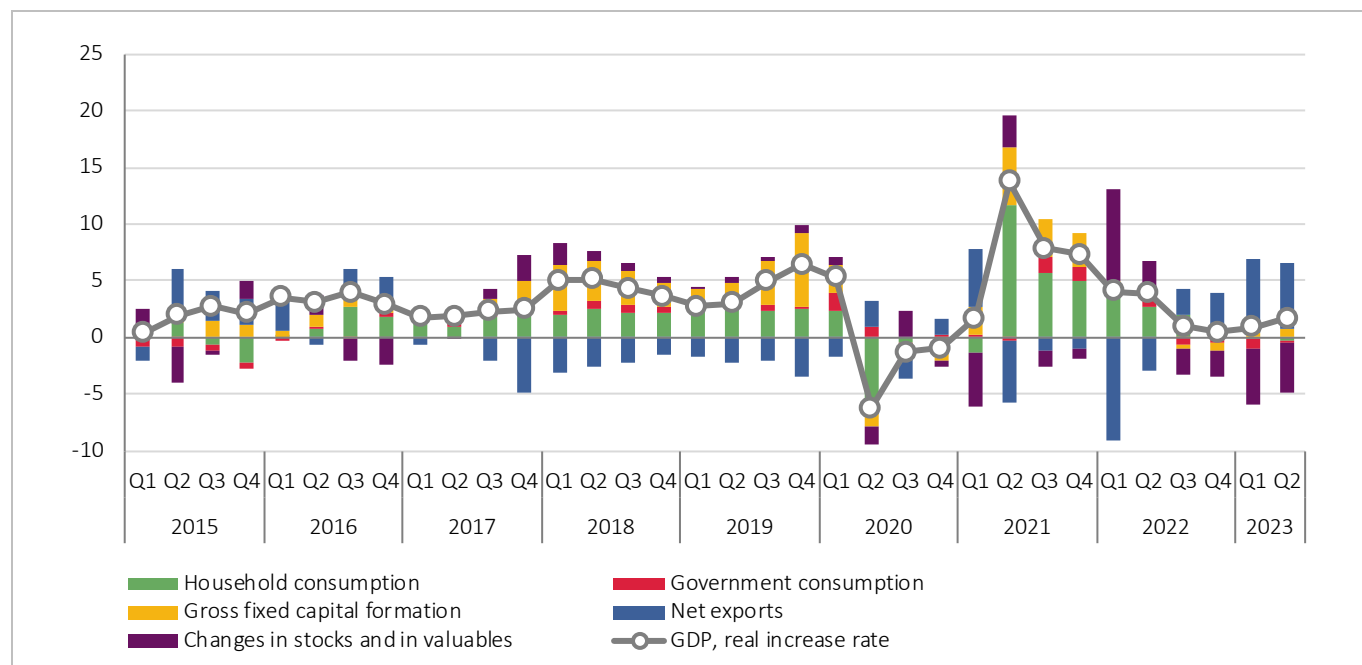
In the second quarter of 2023, GDP real increase of 1.7% was recorded relative to the same period last year. Significant positive contribution to GDP trend was made by section of services, excluding trade, and the section of construction, with 1.2 and 0.8 p.p., respectively. Significant negative contribution was noted in the section of trade with 0.6 p.p.

Observed by expenditure aggregates, in the second quarter of 2023, relative to the same period last year, gross fixed capital formation and export recorded growth of 3.9% and 2.1%, with contribution to GDP trend of 0.8 and 1.3 p.p., respectively. Household consumption recorded fall of 0.5%, government consumption of 1.1%, and import of 5.8% compared to Q2 2022, with contribution to GDP trend of 0.3 p.p., 0.2 p.p. and 4.4 p.p., respectively.

Table 2.1. GDP – expenditure aggregates, real inter-annual growth rates, Q1 2021 – Q2 2023 (%)
(comparison with the same period of the previous year)

	2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
GDP	1.7	13.8	7.8	7.3	4.0	3.8	1.0	0.5	0.9	1.7
Household consumption	-2.0	17.3	8.3	7.5	6.8	3.8	3.0	1.5	-0.2	-0.5
Government consumption	1.7	-1.5	9.3	7.2	2.7	4.9	-3.8	-2.4	-4.8	-1.1
Gross fixed capital formation	11.5	25.1	15.6	13.0	1.1	2.1	-1.9	-2.7	2.2	3.9
Exports	8.6	36.3	22.5	14.0	20.0	21.6	16.9	12.9	8.3	2.1
Imports	-1.5	42.4	21.2	13.8	34.9	22.9	11.0	6.6	-1.6	-5.8

Chart 2.1. Contributions to inter – annual GDP growth rate – expenditure aggregates (p.p.)



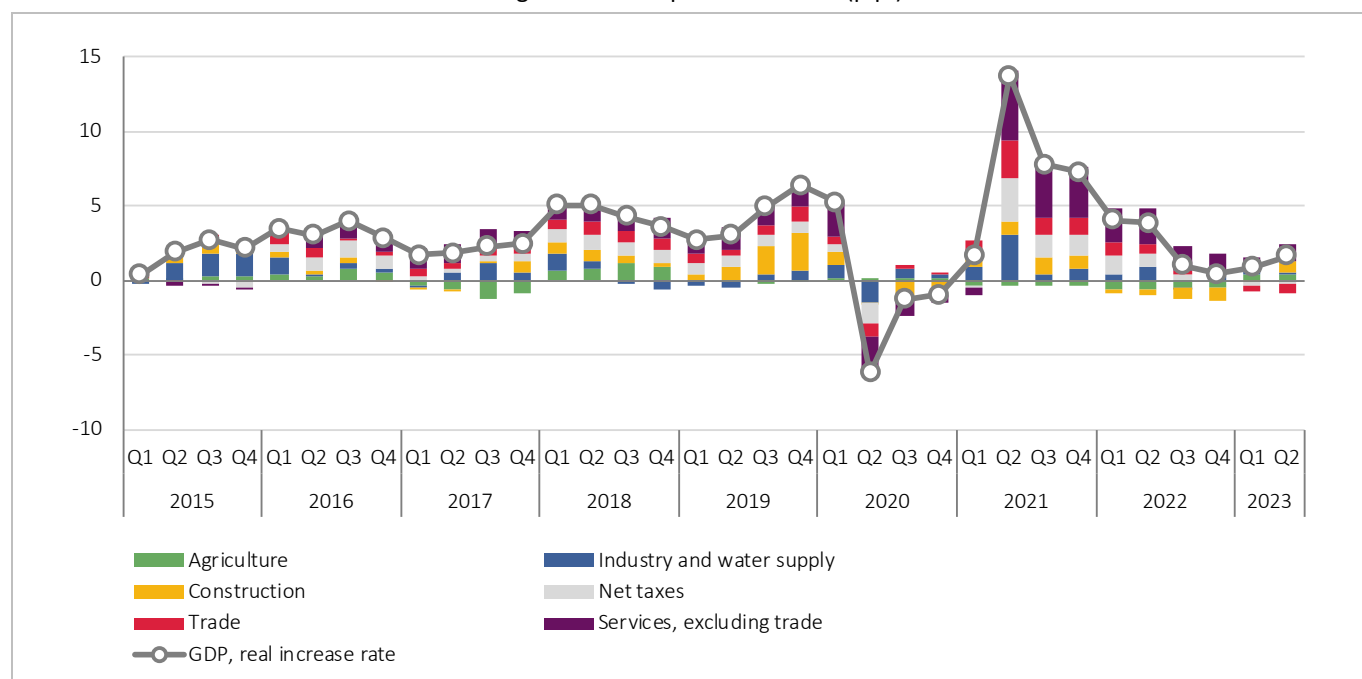
Observed from the **production side**, the greatest positive contribution to GDP trend in Q2 2023 resulted from increased activity in service section (excluding trade), and construction section, with 1.2 p.p. and 0.8 p.p., respectively.

Significant negative contribution to GDP trend was made by the trade section with 0.6 p.p.

Table 2.2. GDP– production side, real inter-annual growth rates, Q1 2021 – Q2 2023 (%)
(comparison to the same period of the previous year)

	2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
GDP	1.7	13.8	7.8	7.3	4.0	3.8	1.0	0.5	0.9	1.7
Agriculture	-5.9	-5.4	-5.6	-5.8	-8.4	-8.6	-8.5	-7.8	10.5	9.3
Industry and water supply	4.4	15.8	2.3	3.9	1.9	4.5	-0.3	1.3	2.5	0.8
Construction	19.8	18.3	19.4	14.4	-5.7	-6.9	-12.1	-12.5	-1.4	15.1
Trade	8.2	23.4	10.6	10.1	7.6	5.5	2.4	0.4	-3.3	-4.7
Services, excl. trade	-1.2	11.2	10.0	8.8	5.7	5.9	3.9	3.4	2.1	2.9
Net taxes	-0.9	16.6	9.2	8.3	8.1	5.1	2.5	1.1	-1.3	-1.2

Chart 2.2. Contributions to inter – annual GDP growth rate – production side (p.p.)



3. INDUSTRIAL PRODUCTION

3.1. TOTAL INDUSTRIAL PRODUCTION

Total industrial production in the Republic of Serbia in the period January – June 2023 increased by 1.7% relative to the same period 2022. Growth was noted only in the section Electricity, gas, steam and air conditioning supply (16.9%), while in the sections Mining and quarrying and Manufacturing recorded was the fall of -0.5% and -1%, respectively.

Chart 3.1. Cumulative trend of total industrial production and its sections, growth rates (%) (January – June 2023 relative to the same period 2022)

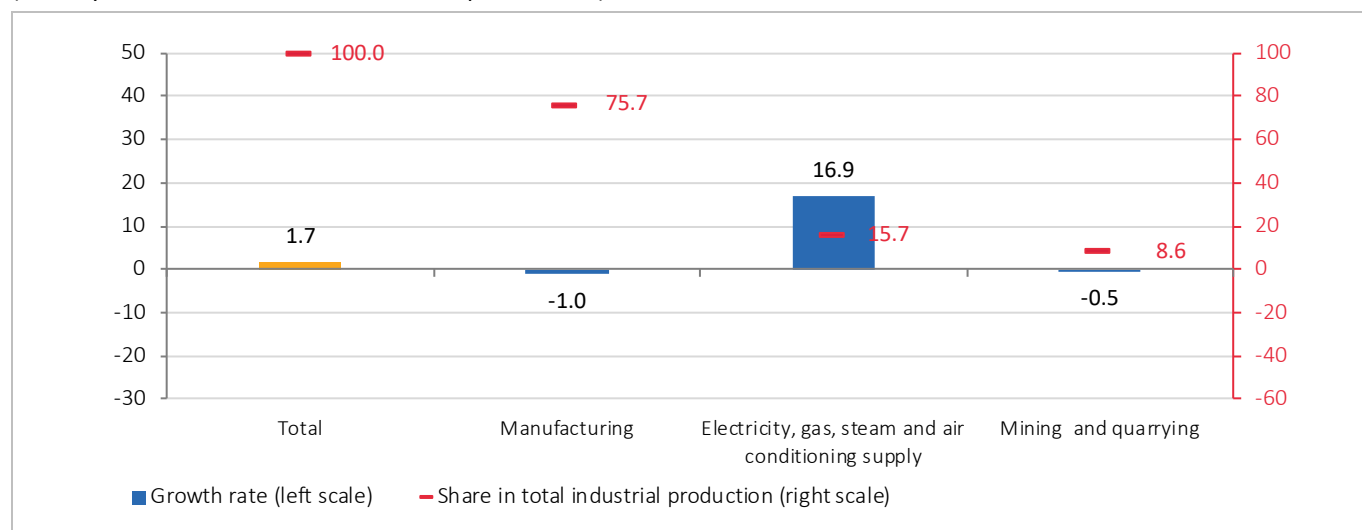
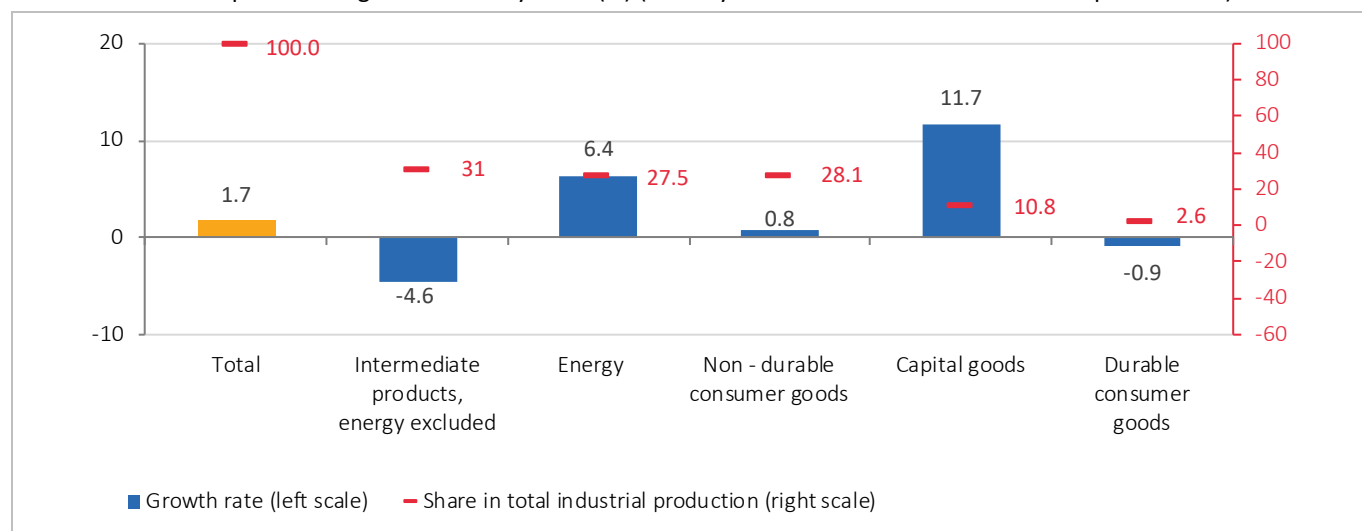


Chart 3.2. Industrial production growth rates by MIGs (%) (January – June 2023 relative to the same period 2022)



The section of **Electricity, gas, steam and air conditioning supply** provided the greatest contribution (2.4 p.p.) in the total industrial production trend in the period January – June 2023/ January – June 2022 . Negative contribution was recorded in the section of **Manufacturing** (-0.7 p.p.), while the contribution of **Mining and quarrying** was neutral (0 p.p.).

Table 3.1. Industrial production, indices (comparison with the same period of the previous year)

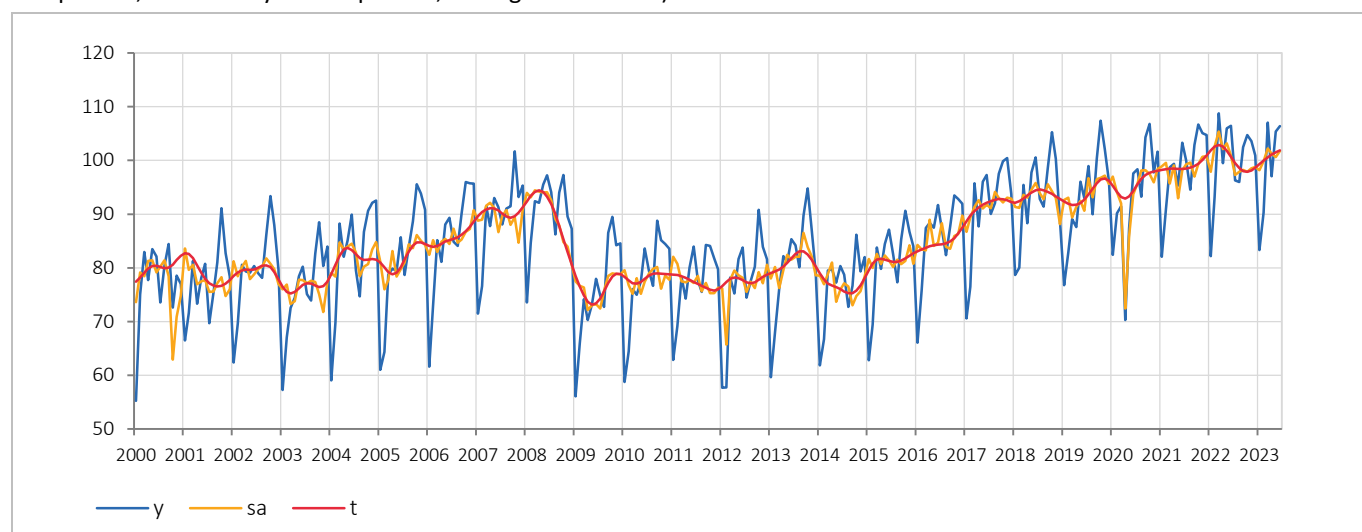
	2021				2022				2023		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q1+Q2+Q3 ¹
Industrial production – total	104.2	116.0	102.6	103.7	101.9	104.8	99.4	100.7	102.5	100.9	102.0
Manufacturing	103.2	117.0	100.4	102.9	104.1	104.7	99.1	97.8	98.5	99.0	100.0
Electricity, gas, steam and air conditioning supply	109.1	107.5	96.0	90.6	80.9	91.8	95.8	106.2	118.6	114.8	
Mining and quarrying	109.0	124.6	140.8	142.9	139.0	132.4	108.5	116.5	104.5	94.3	

¹ Prognoses (obtained on the basis of time series analysis models).

3.2. MANUFACTURING (C) (share of 75.7% total industrial production index)

Trend-cycle component of Manufacturing, in the second quarter 2023 started the increasing trend (chart 3.3).

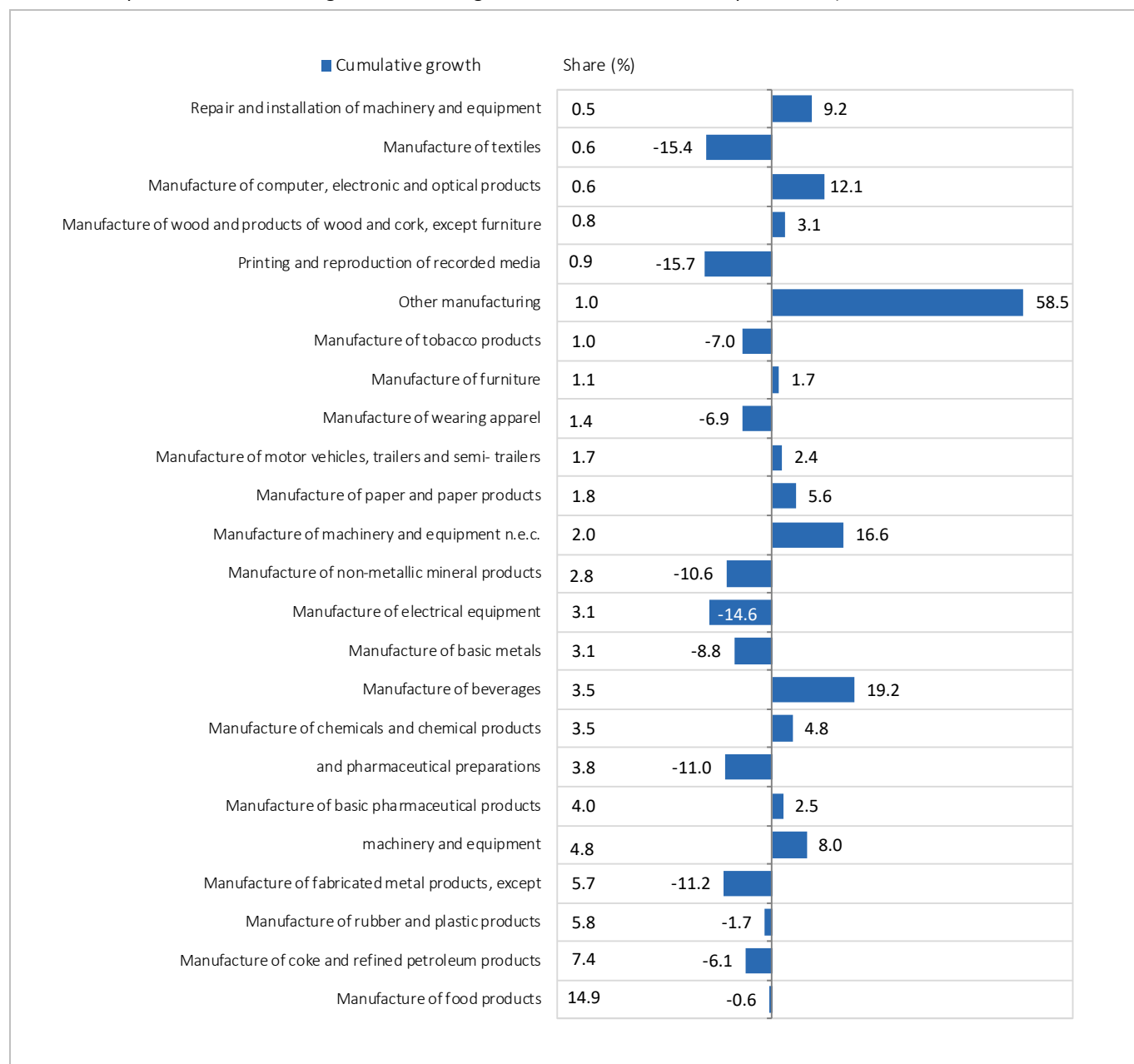
Chart 3.3. Components of Manufacturing time series, indices (y – original series, sa – series with excluded seasonal component, t – trend-cycle component, average 2022 = 100)



Observed by divisions, Manufacturing in the first half of 2023 increased in 12 out of 24 divisions (mutually participating with 25.3% in total industry), if compared with the same period 2022. The most significant divisions – measured by the share in total industrial production - in which positive results were noted in the period January – June 2023 were: Manufacture of basic pharmaceutical products and pharmaceutical preparations (growth of 8%), Manufacture of beverages (growth of 2.5%) and Manufacture of electrical equipment (growth of 4.8%).

Decrease was recorded in 12 divisions (mutually participating with 50.5% in total industry): Manufacture of food products (fall of -0.6%), Manufacture of coke and refined petroleum products (fall of -6.1%), Manufacture of rubber and plastic products (fall of -1.7%), Manufacture of non-metallic mineral products, excluding machinery (fall of -11.2%).

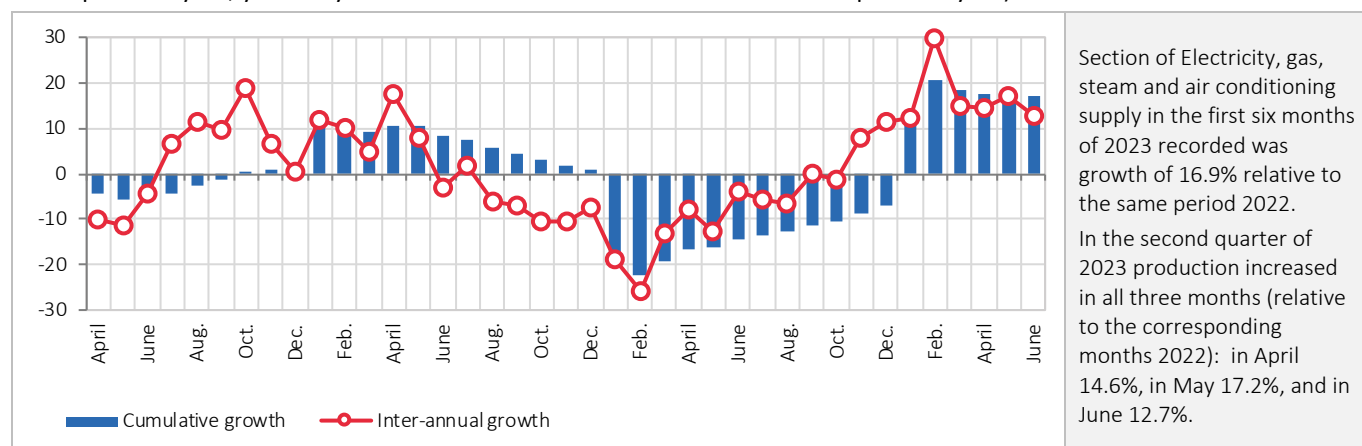
Chart 3.4. Manufacturing by divisions, cumulative growth rates (%) (January – June 2023 relative to the same period 2022); divisions are presented in ascending order according to shares in total industrial production)



3.3. ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY (D)

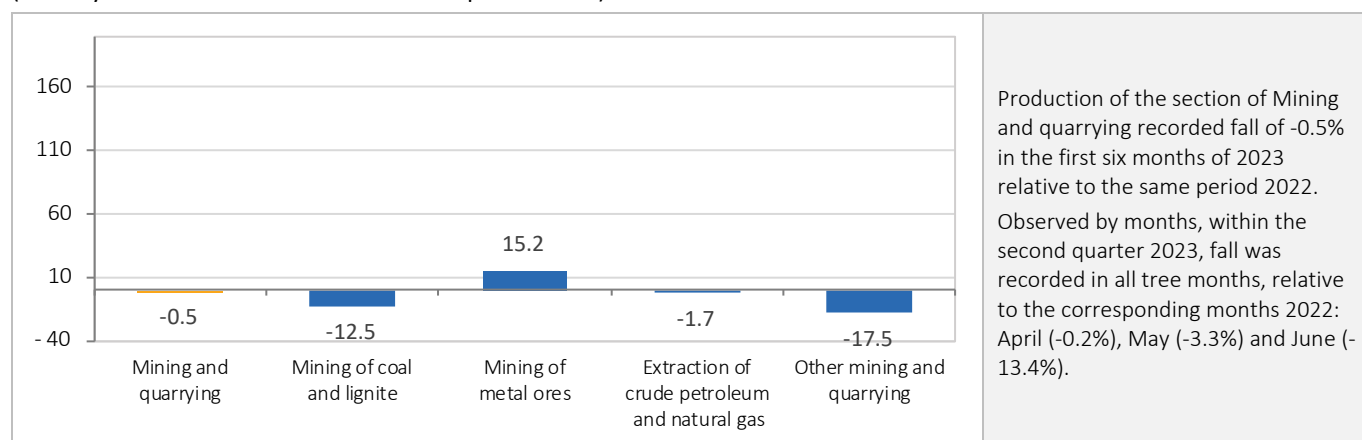
(share of 15.7% in total industrial production index)

Chart 3.5. Cumulative and year-on-year growth rates in energy section (%) (cumulative – period relative to the same period of the previous year; year-on-year – month relative to the same month of the previous year)



3.4. MINING AND QUARRYING (B) (share of 8.6% in total industrial production index)

Chart 3.6. Cumulative growth rates in Mining and quarrying section (%) (January – June 2023 relative to the same period 2022)



HOW TO INTERPRETE THE SERIES?

Seasonal effects can provoke distortions in time series trend, and in such way camouflaging its “real” nature and significant characteristics necessary for precise and detail analysis of the phenomena. When selecting the indicators that will be used for analysis (original, seasonally adjusted or trend), the nature of the observed series and point of the performed analysis should be considered. Three separate components (obtained by series’ disaggregation), together with the original series, describe various aspects of a single phenomenon and are used for versatile analytic purposes – depending on the researcher’s interest. Seasonally adjusted values are used for comparison of the consecutive periods and for estimation of potential value of a series when calendar effects and season effects would not exist, as is the case with industrial production.

4. CONSTRUCTION

4.1. CONSTRUCTION ACTIVITY

In the second quarter of 2023, construction activity in the Republic of Serbia, relative to the same period 2022, increased by 21.1% at current prices, while it increased by 17.9% at constant prices. The price indices of construction materials, which is used as the deflator of construction value, amounted to 102.7 in the observed period.

Value of construction works, expressed at constant prices, increased by 20.8% regarding civil engineering (transport, pipelines, complex industrial construction, etc.), while it increased by 13% regarding buildings relative to the second quarter 2022 .

Table 4.1. Value of performed construction works, quarterly indices (%) (comparison with the same period of the previous year)

	2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Current prices	116.7	124.7	128.8	127.1	110.3	108.4	102.7	99.9	109.2	121.1
Constant prices	117.4	114.9	115.0	110.4	94.1	91.2	86.5	86.3	99.5	117.9

Chart 4.1. Components of time series of Indices of performed construction works on the territory of the Republic of Serbia, at constant prices, indices

(u – original series, sa – series with excluded seasonal component, t – trend cycle component average 2015 = 100)

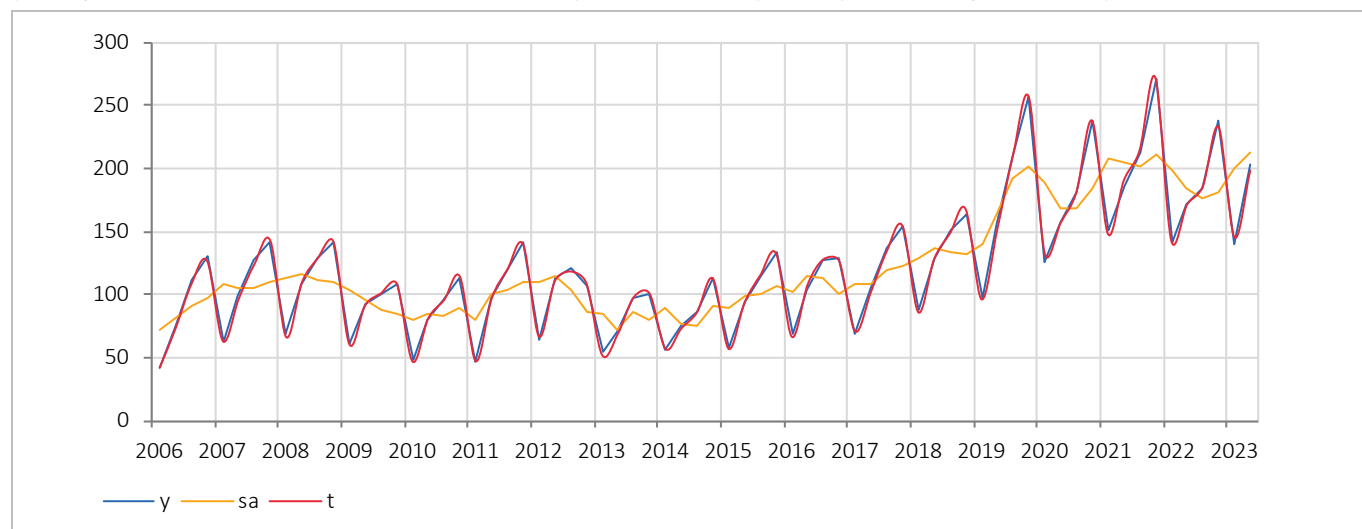
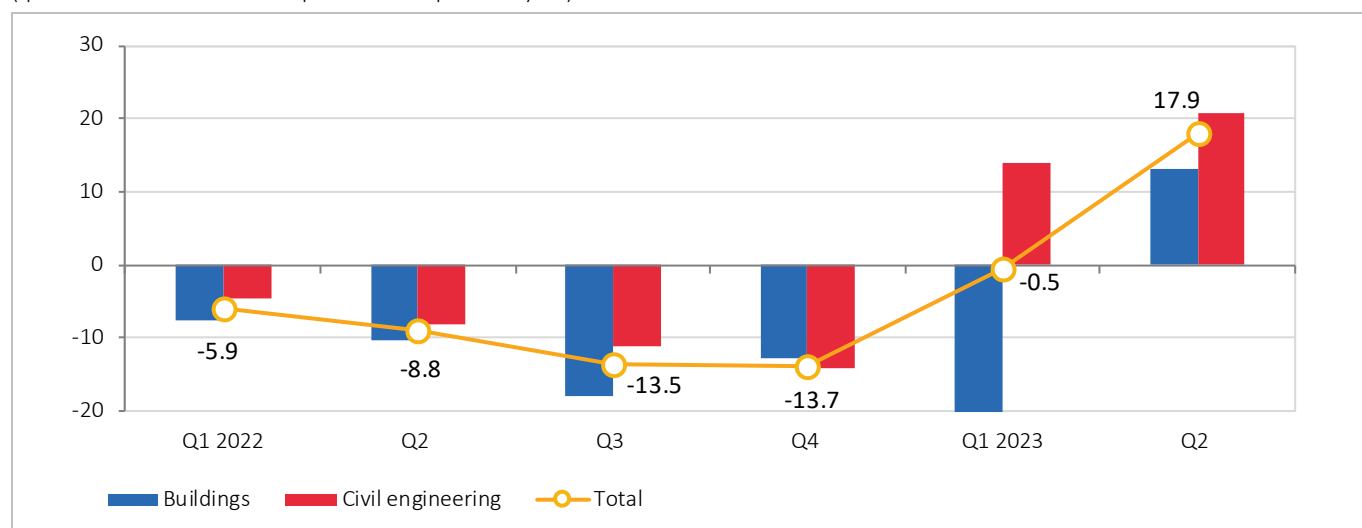


Chart 4.2. Value of performed construction works at constant prices, growth rates (%)
(quarter relative to the same quarter of the previous year)



Observed by regions (Chart 4.3), in the second quarter of 2023, the highest growth rate, compared to the same period of the previous year, was recorded in the Region of Vojvodina and amounted to 47.1%, at constant prices. Observed according to the type of buildings, the greatest value increase was recorded on the modernization of Stara Pazova – Novi Sad railway line, the construction of Ruma – Šabac highway and Fruškogorski Corridor.

In Region of Southern and Eastern Serbia, a growth of 26.3% was achieved at constant prices. An increase in activity was recorded in: residential buildings (a large residential and business complex is being built in Niš, with over 400 dwellings), pipelines (construction of the gas interconnector Niš–Dimitrovgrad) and complex industrial constructions (construction works on the wind farm and within the copper smelter complex "Ziđin" Bor).

In Region of Šumadija and Western Serbia, the value of construction works increased by 10% compared to the same period last year. Very intensive works on the construction of the Moravian Corridor and Preljina–Požega highway continued in this quarter as well.

In Beogradski region, the value of construction works in constant prices increased by 0.2% compared to the second quarter of 2022. Observed according to the type of buildings, the value of the performed works increased both on residential and non-residential buildings, while the biggest decrease was recorded on the constructions of traffic infrastructure, because the construction works on the railway line Belgrade - Stara Pazova were completed last year.

Chart 4.3. Value of performed construction works by regions, at constant prices, growth rates (%)
(quarter relative to the same quarter of the previous year)

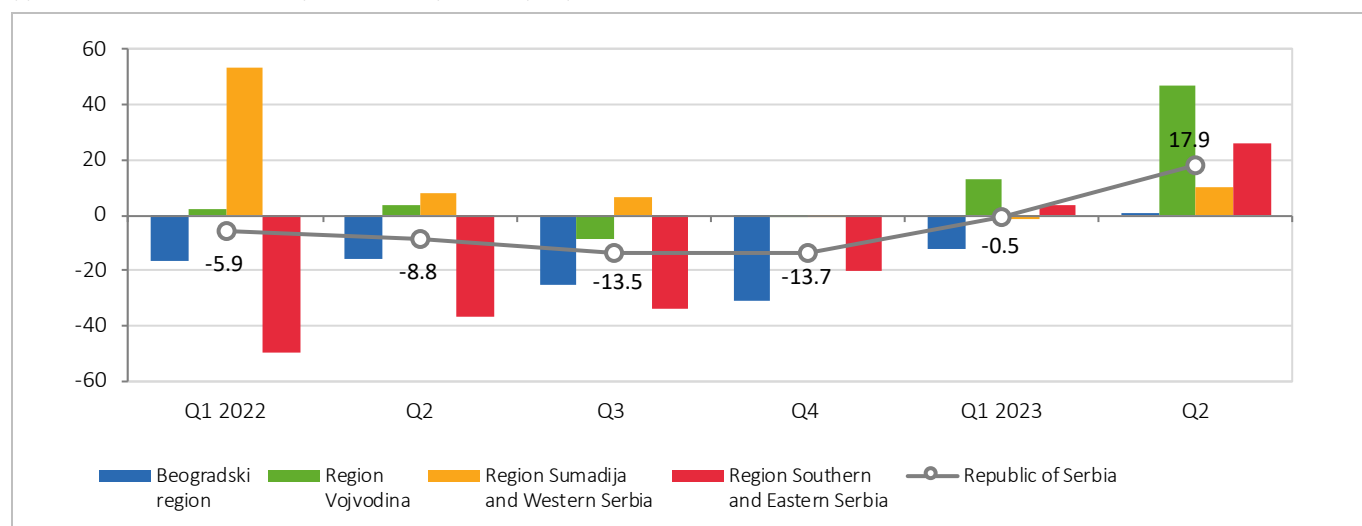
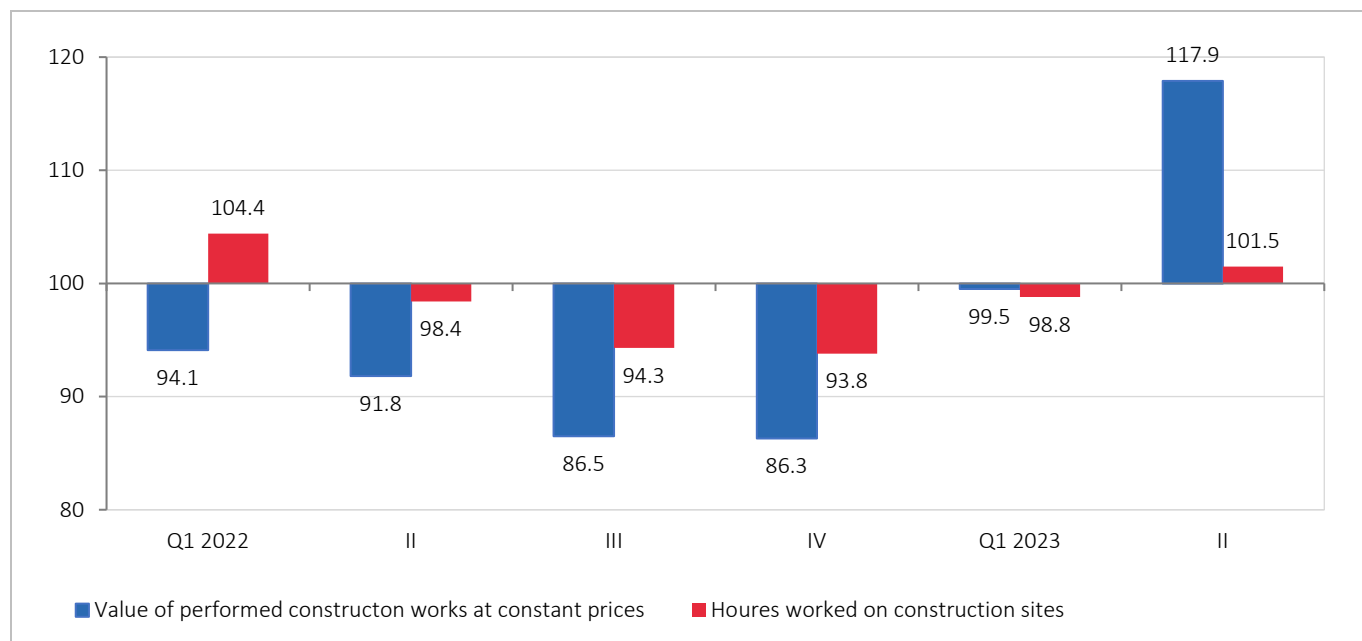


Chart 4.4. Value of performed construction works and hours of work on construction sites, comparative overview, indices
(quarter compared to the same quarter of the previous year)



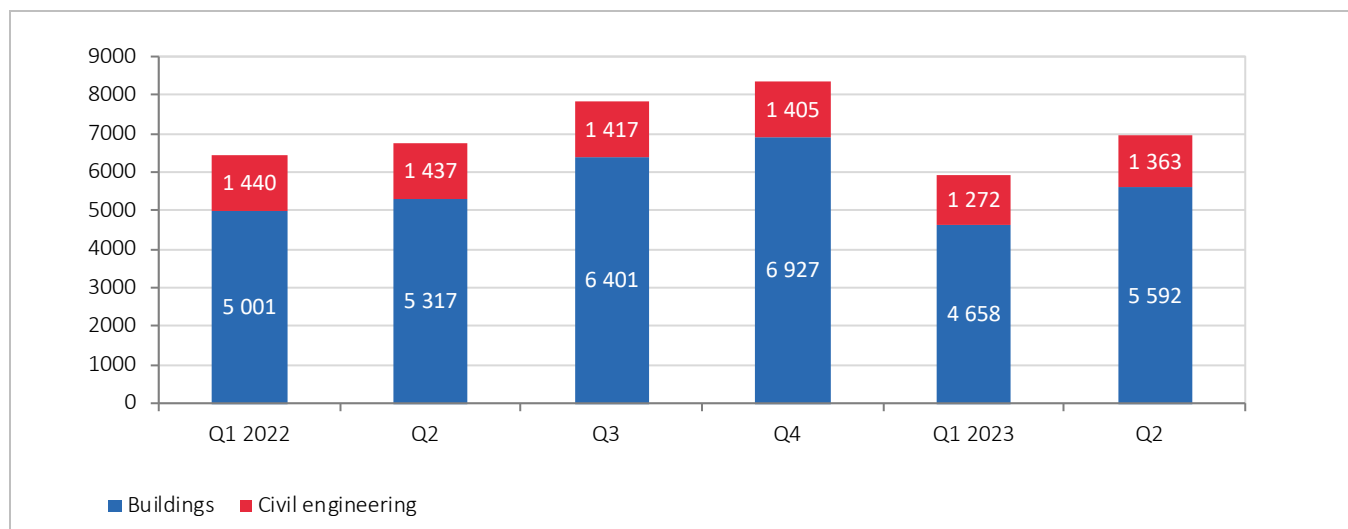
Graph 4.4 shows a comparative overview of the movement of working hours and the value of the works performed on construction sites. In the first quarter of 2022, the value of works was lower, but the number of hired workers was higher. In the second, third and fourth quarters of 2022, the hours of work and the value of the works performed confirm the decline in construction activity. In the first quarter of 2023, both indicators show a slight decline in construction activity. The value of works in the second quarter of 2023 increased by 17.9% compared to the same period of the previous year. Working hours increased by 1.5% compared to the same period of the previous year.

4.2. BUILDING PERMITS

In addition to the value of works performed and hours of work on construction sites, the statistics of construction keep a monthly record of the issued **building permits and decisions**, which approve the implementation of construction works in Serbia and which show the future trend of construction activity.

In the **second quarter 2023**, 6 955 building permits were issued. The greatest part of permits (5 592) related to construction works on buildings, while the rest (1 363) related to transport infrastructure works, pipelines, complex industrial structures, etc. Total number of issued permits in the second quarter 2023 increased by 3.0% related to the same period of the previous year.

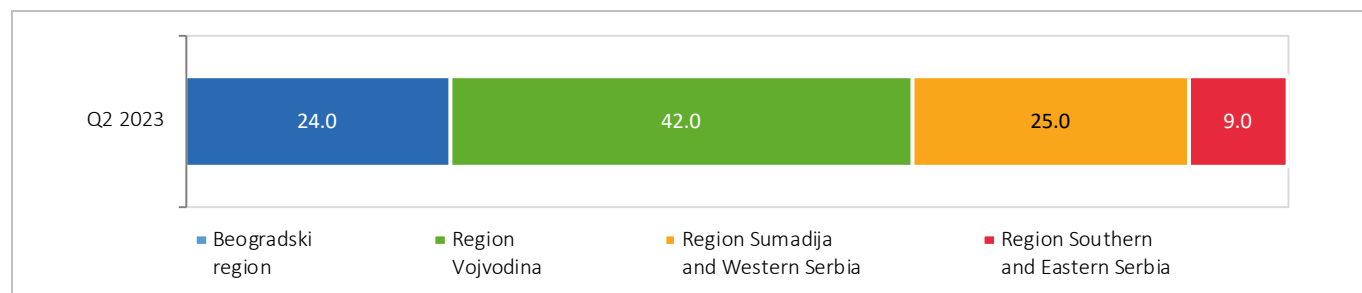
Chart 4.5. Number of issued building permits for buildings and civil engineering



The anticipated value of works, according to the issued permits, in the second quarter, amounts to RSD 269 699 million, which represents the increase of 20.4% compared to the same quarter of the previous year.

Region of Vojvodina has the largest share (42%) in the anticipated value in the second quarter, followed by Region of Šumadija and Western Serbia (25%), Beogradski Region (24%) and Region of Southern and Eastern Serbia (9%).

Chart 4.6. Anticipated value of works according to issued permits, by region; share in %²⁰



²⁰ Note: Instead of the previously published data on the percentage share of the number of permits by region, in the future we will show the share of the anticipated value of the works according to the issued permits. Namely, the value of works is a better indicator of the volume of construction activity in the future, while the number of permits does not provide key information about the value of the planned investment, which is the most important for assessing the value of future construction works.



GLOSSARY

Value of performed construction works – the most significant indicator of construction activity trend in Serbia. It presents the value of performed works on construction that the reporting unit performed with workers directly engaged for execution of works.

Value of performed works includes value of work, value of built in material and finished products for incorporating, consumed energy commodities and other expenditures related to performing works on construction. Value of performed works excludes value of subcontractors' works, expenditures of land purchase, design, supervision and VAT.

According to *Classification of Types of Constructions*, applied since 2004, which is completely harmonized with the same Classification of Eurostat, all constructions can be classified into: buildings and civil engineering.

Value on buildings includes value of performed works, both on residential and non-residential buildings.

Civil engineering, besides transport infrastructure (roads, railways, bridges, etc.) involves also works carried out on pipelines, complex industrial structures and other civil engineering n.e.c. (e.g. sport constructions).

5. EXTERNAL TRADE

5.1. EXPORTS OF GOODS (EUR current exchange rate)

Total value of goods export in the Republic of Serbia in the period January – June 2023 increased by 9.4%, relative to the same period 2022. Total export results were mostly influenced by manufacturing increase of 9.6%, as it presents 85.2% of total export, and increase of 179.5% in the section of electricity, gas and steam, presenting 5.6% of total export in the first two quarters 2023.

Chart 5.1. Components of export's time series, indices (u – original series, sa – series with excluded seasonal component, t – trend cycle component, average 2022 = 100)

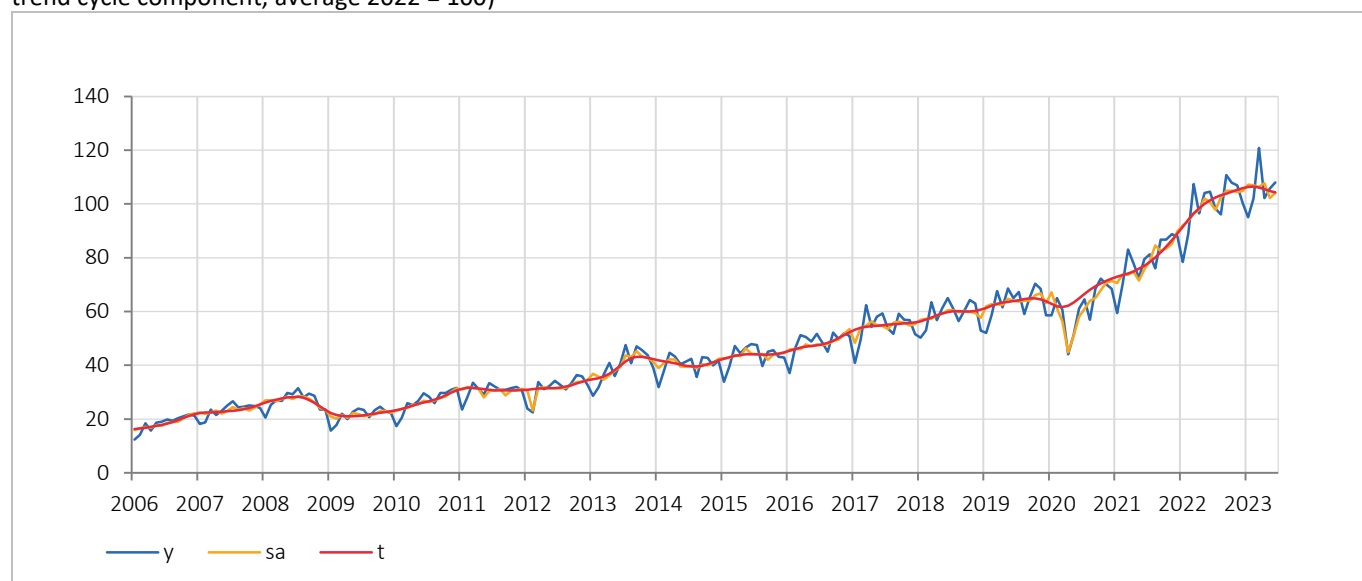
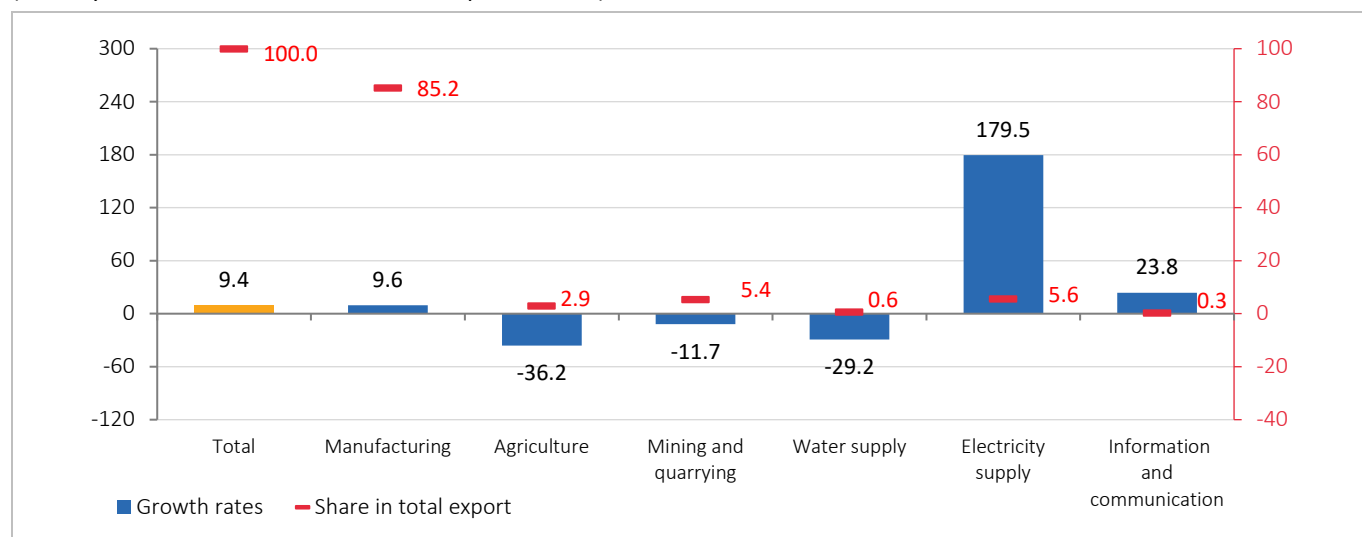


Table 5.1. Export of goods by CA (2010) sections, quarterly indices (comparison with the same period of the previous year)

	2021				2022				2023		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q1+Q2+Q3 ¹
Export – total	114.2	145.6	127.2	123.4	128.5	132.7	122.9	119.5	115.8	103.5	111.0
Manufacturing	111.5	145.4	122.4	122.4	125.9	126.3	122.3	117.5	112.0	107.4	...
Agriculture, forestry, and fishing	132.7	97.1	119.2	73.5	76.3	117.6	98.0	95.6	72.4	56.1	...
Mining and quarrying	202.8	916.1	1369.6	366.8	1129.0	330.3	160.1	122.2	129.4	56.9	...

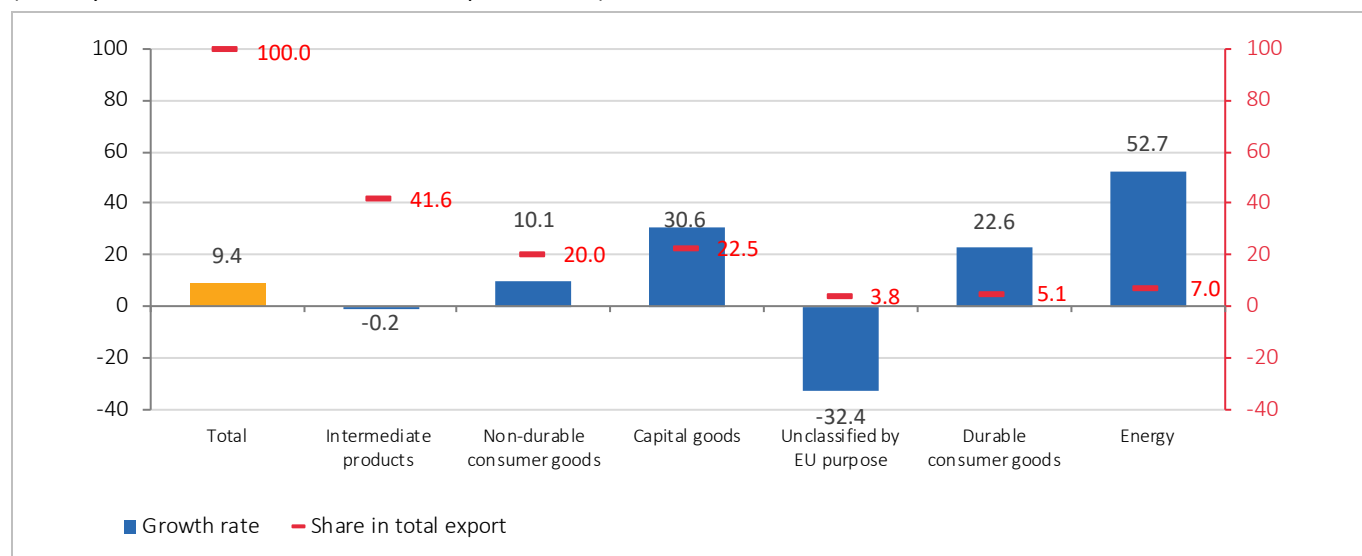
¹ Prognosis (obtained on the basis of a time series analysis model).

Chart 5.2. Cumulative growth rates of export by CA (2010) sections and sections' share in export (%)
(January – June 2023 relative to the same period 2022)



Observed by economic purpose, total export results in the period January – June 2023 were mostly influenced (contribution 5.8 p.p.) by exports of **capital products** (share of 22.5% and increase of 30.6%) and **energy** (share of 7%, increase of 52.7% and contribution 2.6 p.p.).

Chart 5.3. Cumulative growth rates of exports according to the economic purpose of the European Union (%)
(January – June 2023 relative to the same period 2022)



5.2. IMPORTS OF GOODS (EUR current exchange rate)

Total value of goods import in Serbia in January – June 2023 decreased by 5% relative to the same period 2022. Import results were mostly influenced by the section of manufacturing (decrease of 6.1%), as it presents 69.8% of total imports, and 18.6% increase in the section of import of unclassified products (12.3% of total imports) in January - June 2023.

Chart 5.4. Components of import's time series, indices (u – original series, sa – series with excluded seasonal component, t – trend cycle component, average 2022 = 100)

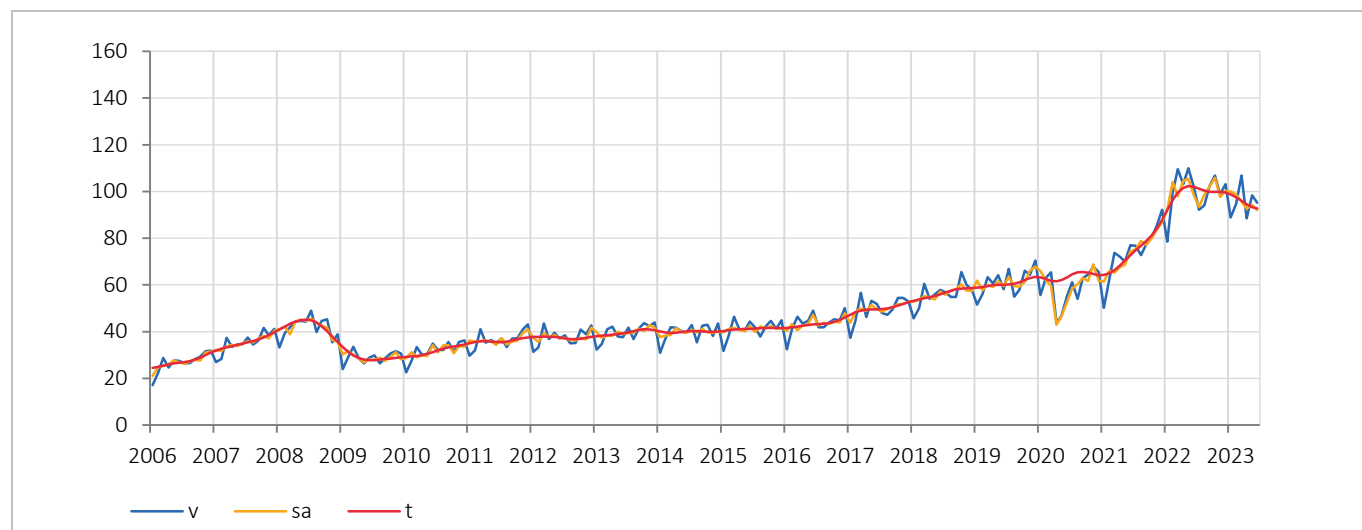
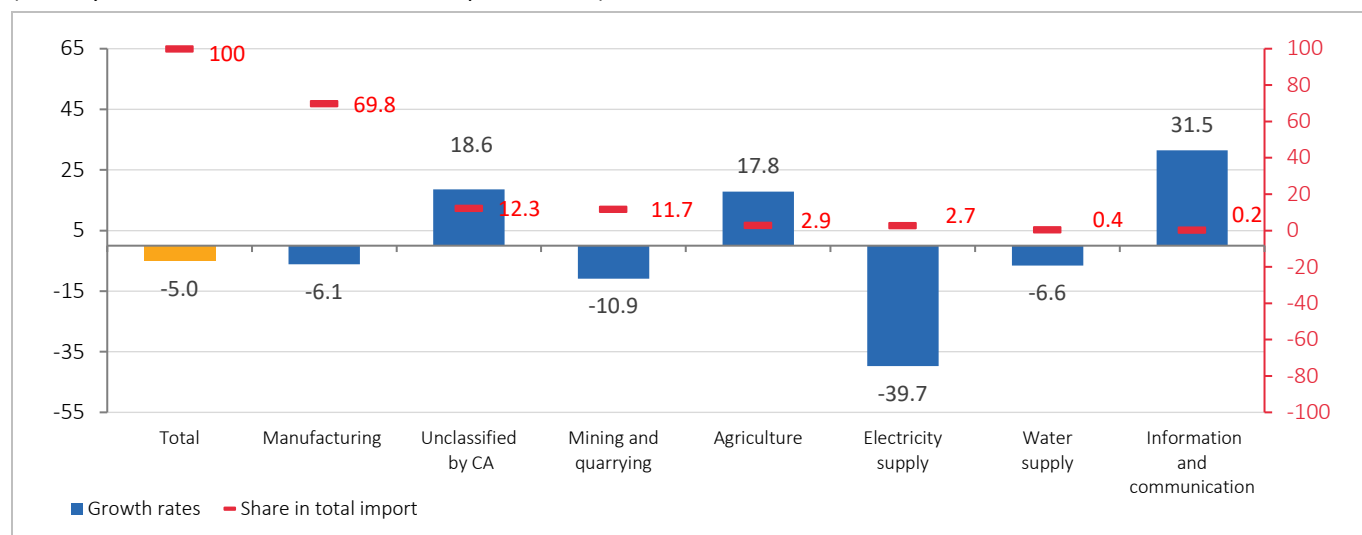


Table 5.2. Import of goods by CA (2010) sections, quarterly indices (comparison with the same period of the previous year)

	2021				2022				2023		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q1+Q2+Q3 ¹
Import – total	100.5	149.4	125.9	127.5	148.5	143.8	123.1	119.7	100.7	89.5	95.0
Manufacturing	104.8	148.9	120.6	123.3	130.6	134.2	119.6	112.5	101.3	87.4	...
Agriculture, forestry, and fishing	102.3	101.0	113.6	143.8	127.6	123.5	134.5	127.0	124.5	110.3	...
Mining and quarrying	58.2	206.4	181.1	158.2	373.7	210.8	140.0	186.3	95.4	81.2	...

¹ Prognosis (obtained on the basis of a time series analysis model).

Chart 5.5. Cumulative growth rates of import by CA (2010) sections and sections' share in import (%) (January – June 2023 relative to the same period 2022)



Observed by MIGs, the greatest influence (negative contribution of -4.7 p.p.) on total import in the period January – June 2023 related to import of **energy** (share of 15.4%, decrease of 24.5%) and **intermediate products** (share of 34.7%, decrease of 6.4% and negative contribution of -2.3 p.p.).

Chart 5.6. Cumulative growth rates of imports according to the economic purpose of the European Union (%) (January – June 2023 relative to the same period 2022)

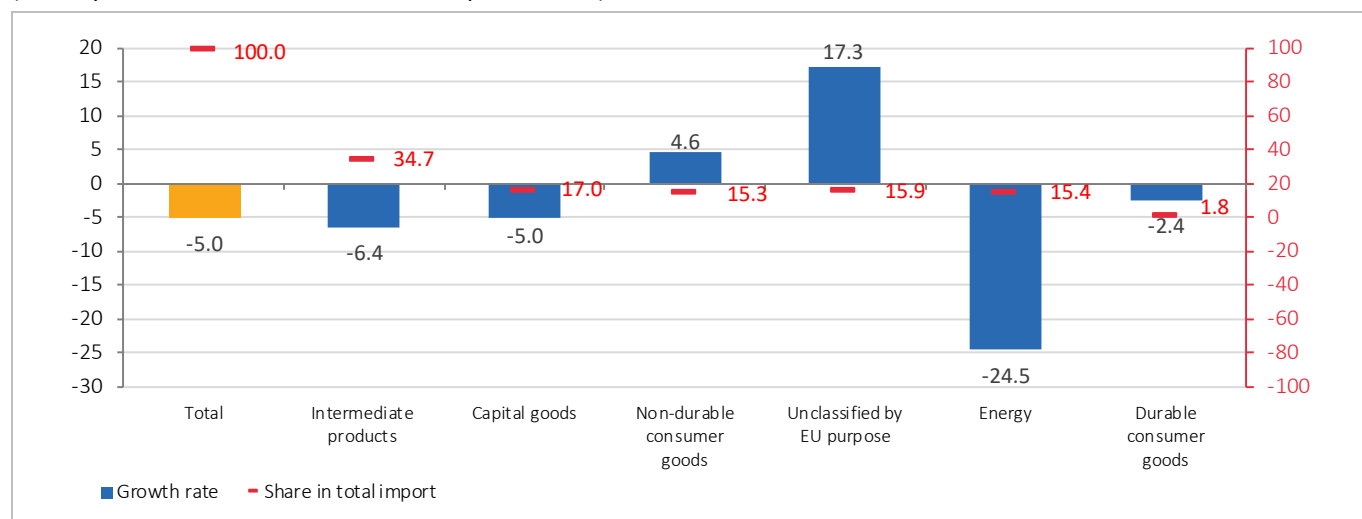
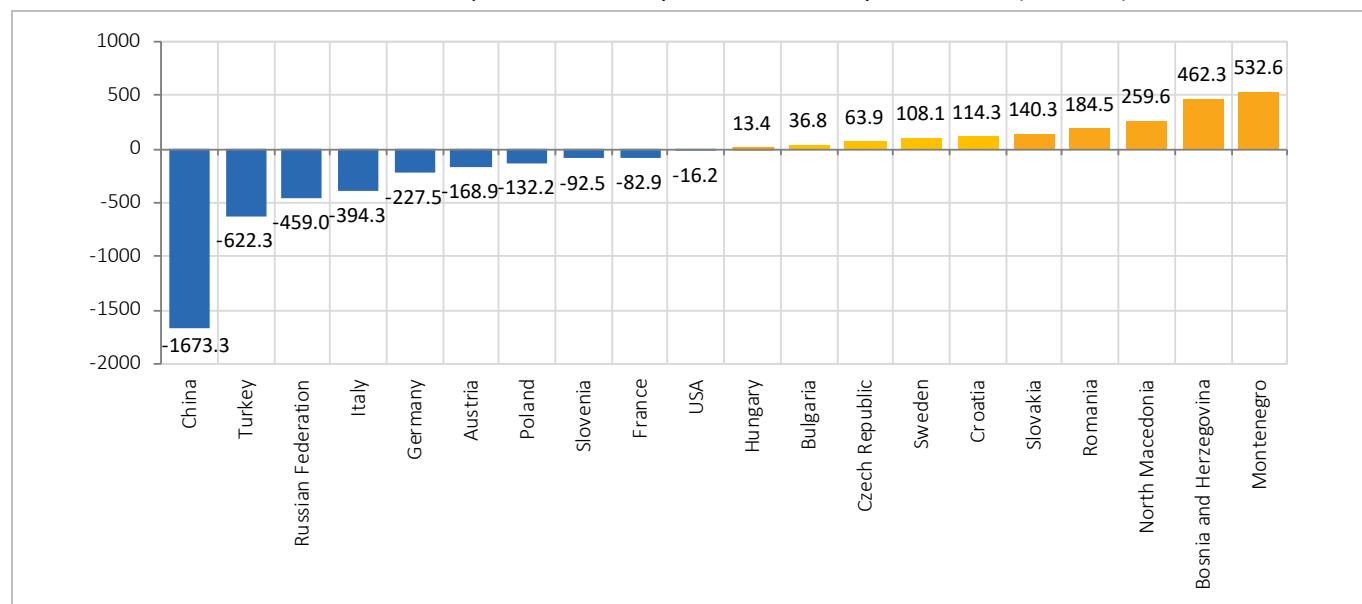


Chart 5.7 shows the 20 largest external trade partners of the Republic of Serbia, which account for 79% of the total external trade exchange. The Republic of Serbia achieved a positive external trade balance, i.e. a surplus in the period January – June 2023, with 10 European countries (a total of about EUR 1.9 billion), of which Montenegro is on the first place (a surplus of EUR 532.6 million). In this period, the Republic of Serbia exported the most food products (16.8% of total export to Montenegro), electricity, gas and steam (13.9% of total export to MNE) and chemicals and chemical products (6.5% of total export to MNE).

On the other hand, negative external trade balance, i.e. deficit, was recorded in 10 countries and amounts to a total of EUR - 3.9 billion. The largest external trade deficit in January – June 2023 was recorded in trade with China (EUR -1.7 billion) and Turkey (balance EUR -622.3 million). Observed by CA product activities (2010), product imports from China mostly consisted of imports of unclassified products (17.8% of total imports from China), other n.e.c. machinery and equipment (16.9% of total

imports from China), as well as computers, electronic and optical products (16.7% of total imports from China). With Turkey, the negative external trade balance is the result of the high value of basic metals (13.9% of total imports from Turkey), and electrical equipment (13.1% of total imports from Turkey), followed by the Russian Federation (deficit of EUR -459 million), Italy (EUR -394.3 million) and Germany (EUR -227.5 million).

Chart 5.7. External trade balance of the Republic of Serbia by countries, January – June 2023 (EUR mill.)



5.3. THE MOST SIGNIFICANT EXTERNAL TRADE PARTNERS

Table 5.3. The major external trade partners

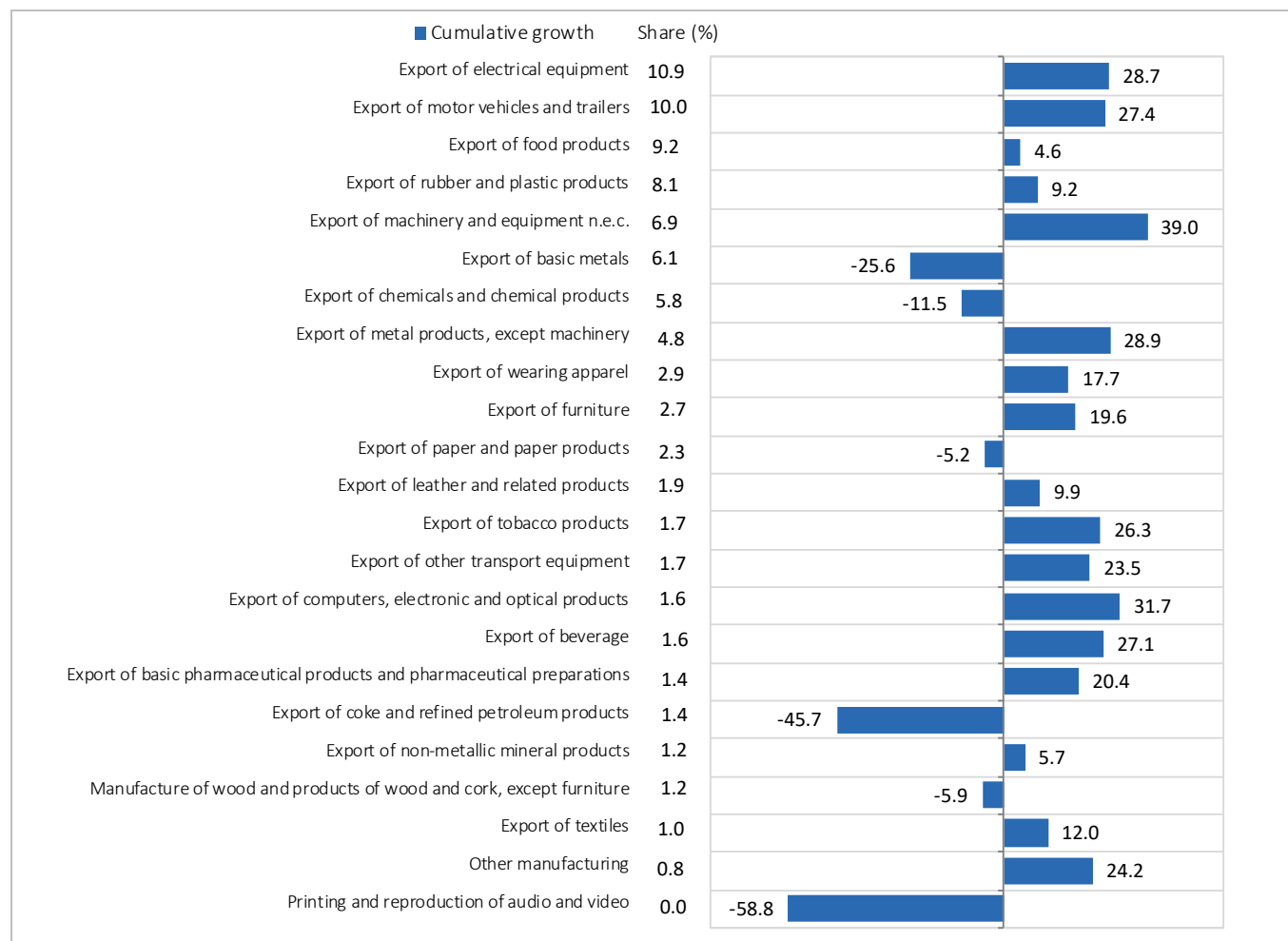
Export	EUR mill.	Import	EUR mill.
Germany	2155.5	Germany	2383.0
Bosnia and Herzegovina	977.3	China	2189.3
Italy	934.0	Italy	1328.3
Hungary	807.6	Russian Federation	1073.3
Romania	763.1	Turkey	880.4

The most significant external trade partners in the first half of 2023 were the countries with which Serbia has signed agreements on free trade. The EU member countries account for 59.9% of total external trade, followed by Asia – Pacific Economic Cooperation, APEC, with the share of 18.0%. The major external trade partners are separately presented in Table 5.3.

5.4. MANUFACTURING (C) (share of 85.2% in total export and 69.8% in total import)

Export of manufacturing recorded growth of 9.6% in the first half 2023, relative to the same period 2022. Out of 23 divisions, cumulative growth was noted in 17 divisions, mutually presenting 68.4% of total manufacturing export. The export of **electrical equipment**, the division with the greatest separate export value (EUR 1.6 billion) recorded a cumulative growth of 28.7%, with share of 10.9% in total export (9.3% in the same period in 2022). Export of **motor vehicles and trailers** recorded a cumulative growth of 27.4%, with an export value of EUR 1.5 billion and a share of 10% in total export, (8.6% in the same period 2022). The export of **food products** noted a cumulative growth of 4.6%, and export value of EUR 1.3 billion, with a share in total exports of 9.2%. The export of **rubber and plastic products**, with the export value of EUR 1.2 billion and a participation in total exports of 8.1%, records a cumulative growth of 9.2%. The export of **machinery and equipment n.e.c.** is the division that is positioned on the fifth place by value in the total export of manufacturing, with a share of 6.9%, a cumulative growth of 39% and an export value of EUR 1 billion.

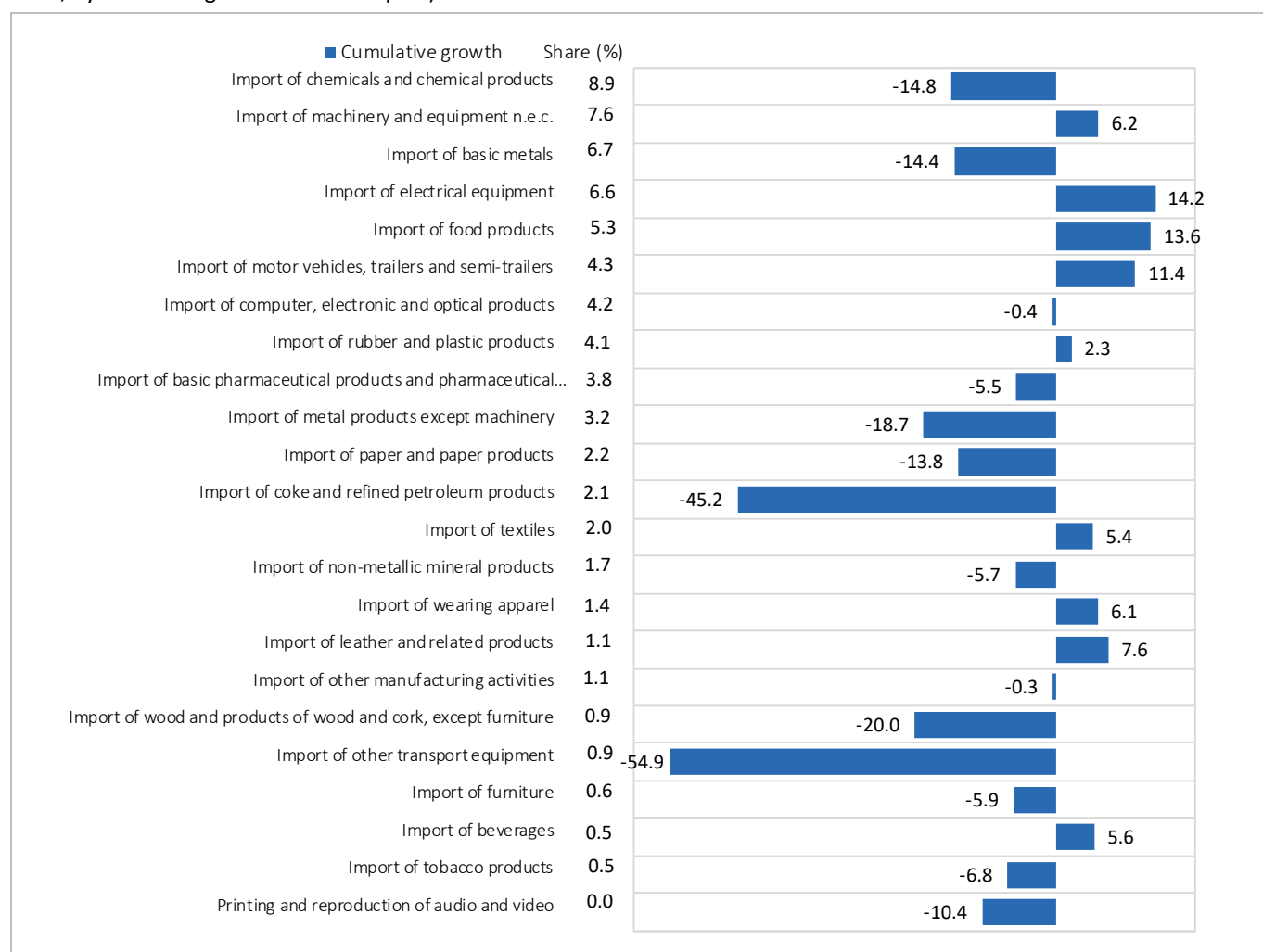
Chart 5.8. Export of manufacturing by divisions, cumulative growth (%) (January – June 2023 relative to the same period 2022, by descending share in total export)



Import of manufacturing in the first half of 2023, compared to the same period 2022, achieved a fall of 6.1%, whereby growth was realized in 9 out of 23 divisions, mutually presenting 32.9% of total import.

The import of **chemicals and chemical products**, the division with the highest separate import value (EUR 1.7 billion), achieved a cumulative fall of 14.8%, with a share in total imports of 8.9% (10% in the same period of the previous year). The import of **machinery and equipment n.e.c.** recorded a cumulative growth of 6.2% and an import value of EUR 1.4 billion, with a share of 7.6% in total imports (6.8% in the same period of the previous year). The import of **basic metals**, with an import value of EUR 1.2 billion and a share of 6.7%, recorded a cumulative fall of 14.4%. The import of **electrical equipment**, with a value of 1.2 billion euros and a participation in total imports of 6.6%, recorded a cumulative growth of 14.2%. The import of **food products** is the area that is positioned on the fifth place according to the value of the total import of manufacturing, with a share of 5.3%, cumulative growth of 13.6% and an import value of EUR 993.5 million.

Chart 5.9. Import of manufacturing by divisions, cumulative growth (%) (January – June 2023 relative to the same period 2022, by descending share in total import)



5.5. AGRICULTURE, FORESTRY AND FISHING (A)

(share of 2.9% in total export and 2.9% in total import)

Export in this section in the period January – June 2023 realized decrease of 36.2%, as well as decreased share from 4.9% (in 2022) to 2.9% as recorded in the first half of 2023. The cumulative drop of 47.3% in exports of cereals (except rice), leguminous crops and oil seeds, a group that makes up 52.7% of the entire section's exports in the observed period, contributed the most to this result. Export of pome and stone fruits- the next group by share (12.4%) decreased by 34.1% in the period January – June 2023 relative to the same period 2022.

On the other hand, import recorded growth of 17.8% in the period January – June 2023 relative to the same period 2022 and share of 2.9% in total import. The group with the largest participation in the section (21.0%) –vegetables, root and carotid plants recorded growth of 25.2% in the period January – June 2023. The next group, by share (20.3%) refers to cereals (except rice), leguminous and oil seeds achieved growth of 66.8%, as well as tobacco planting (imports increase of 31.5% and share of 10.3%.

5.6. MINING AND QUARRYING (B) (share of 5.4% in total export and 11.7% in total import)

The section of Mining and quarrying records decrease in total export, from 6.7% in the first half of 2022 to 5.4% in the same period 2023. The realized value of exports in the period January – June 2023 is EUR 789.5 million, which is by 11.7% less than exports in the same period 2022. This result is a consequence of the fall in the export of metal ores, a group that accounts for 98.5% of the exports of the entire section, and which achieved a fall of 11.8% compared to the same period 2022.

Import of this section in the first half of 2023 amounts to EUR 2,2 billion, presenting the share of 11.7% in total import (12.4% in the same period 2022). In the first half of 2023 in the section of mining and quarrying, import decrease was 10.9% relative to the same period 2022.

The fall in import of this section was largely caused by 21.7% fall in the import of crude oil and natural gas, a group that accounts for 78.6% of the entire sector's imports.



Glossary

Unclassified goods by CA (2010), involves storage goods, goods in free zone, as well as goods for which customs tariff is not entered/ filled.

6. DOMESTIC TRADE

6.1. RETAIL TRADE TURNOVER (Division 47 of the Classification of Activities)

Retail trade turnover in the first half of 2023, relative to the same period 2022, increased by 8.7% at current prices and decreased by 4.7% at constant prices.

Table 6.1. Retail trade turnover, indices (comparison with the same period of the previous year)

	2021				2022				2023		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q1+ Q2+ Q3 ¹
Current prices	104.8	124.2	114.3	118.9	124.0	121.4	123.0	120.1	111.7	106.1	110.0
Constant prices ²	104.7	118.6	107.7	108.4	111.0	106.2	105.0	102.2	96.6	93.9	97.0

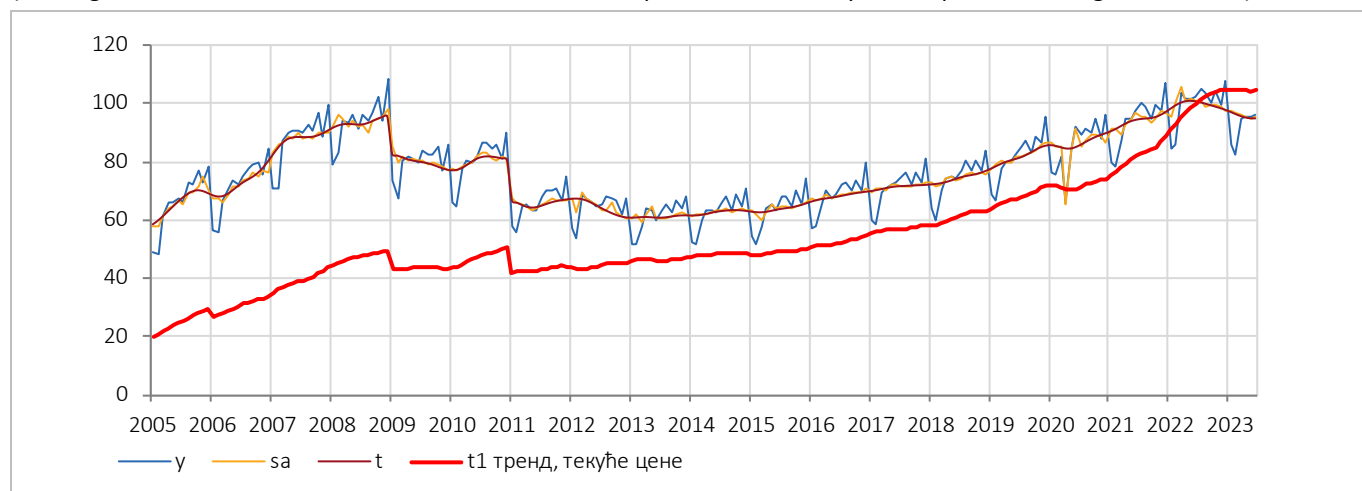
¹ Prognosis (obtained on the basis of time series model analysis).

² Indices are recalculated through monthly indices at constant prices.

After the ten-year long trend of growth in retail trade, in the first half of the year, the retail trade turnover at current prices is steady. Turnover growth rates at current prices are significantly higher than at constant prices, which is a consequence of accelerated inflation.

Chart 6.1. Components of time series of retail trade turnover at constant prices, indices

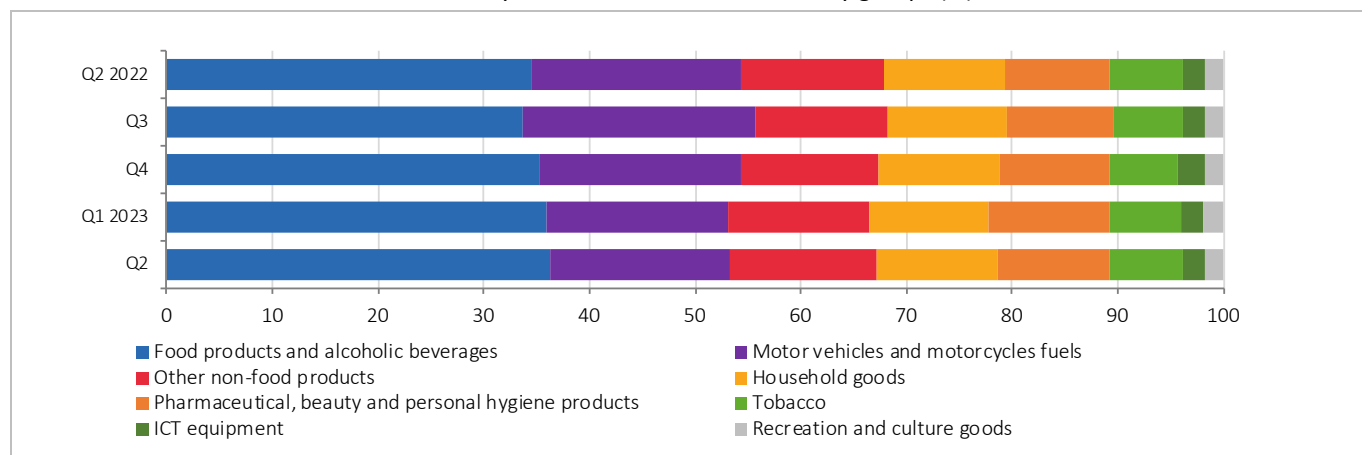
(u – original series, sa – series with excluded seasonal component, t – trend cycle component, average 2022 = 100)



Observed according to the basic aggregates of CA (2010), in the first half of 2023, compared to the same period 2022, the highest turnover growth was achieved in trade of Food, beverages and tobacco (13.7%), then in non-food products (9.6%). On the other hand, trade in motor fuels recorded fall (4.2%). In contrast to current prices, all observed commodity groups, in the first six months of 2023, compared to the same period of the previous year, recorded fall at constant prices. The largest decrease in trade at constant prices was recorded in the groups Food, beverages and tobacco (a decrease of 6%) and Non-food products, except motor fuels (a decrease of 5.4%), while the smallest decrease was recorded in the category of Motor fuels and amounted to 3,2%.

Observed by the structure of trade divisions and commodity groups, in the second quarter 2023, the most notable were food products and alcoholic beverages (36.3%), followed by motor vehicles and motorcycles fuels (17%) and other non-food products (13.8%).

Chart 6.2. Structure of retail trade turnover by trade divisions and commodity groups (%)



6.2. WHOLESALE TRADE TURNOVER (Division 46 of the Classification of Activities)

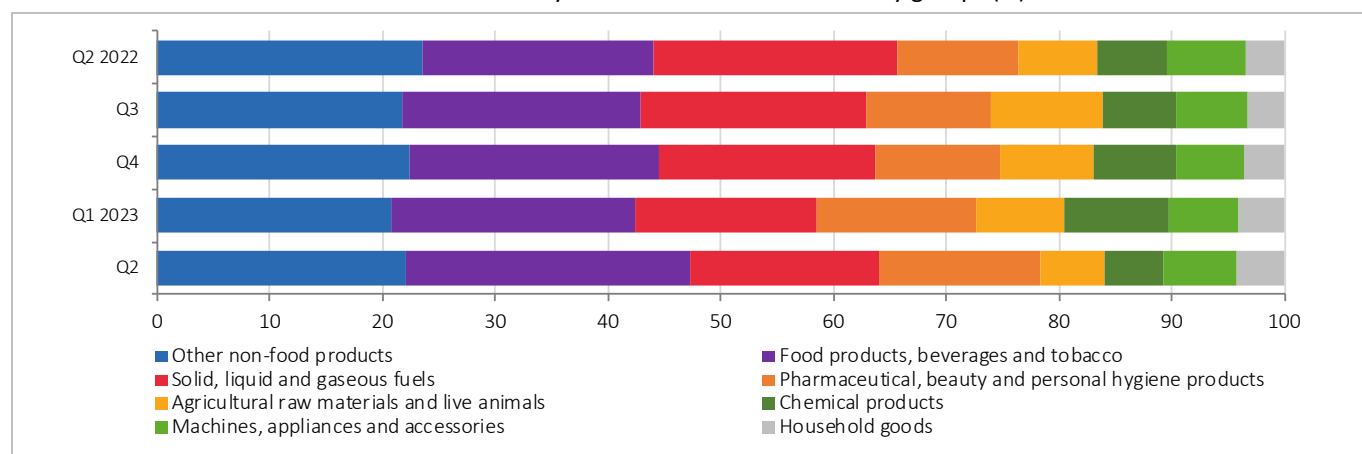
Wholesale trade turnover in the second quarter 2023, compared with the same period 2022 noted decrease of 6.8% at current prices. In the first six months, wholesale trade turnover decreased by 1.6% relative to the same period last year.

Table 6.2. Wholesale trade turnover, indices (comparison with the same period of the previous year)

	2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Current prices	110.9	133.5	123.6	126.5	120.1	122.6	115.2	111.4	104.3	93.2

Observed by trade divisions and commodity groups, in wholesale trade turnover, in the second quarter of 2023, the most notable were food products, beverages and tobacco (25.1%), other non - food products (22.1%), and solid, liquid, and gaseous fuels, (16.8%).

Chart 6.3. Structure of wholesale trade turnover by trade divisions and commodity groups (%)



6.3. TURNOVER IN WHOLESALE AND RETAIL TRADE AND MOTOR VEHICLES REPAIR

(Division 45 of the Classification of Activities)

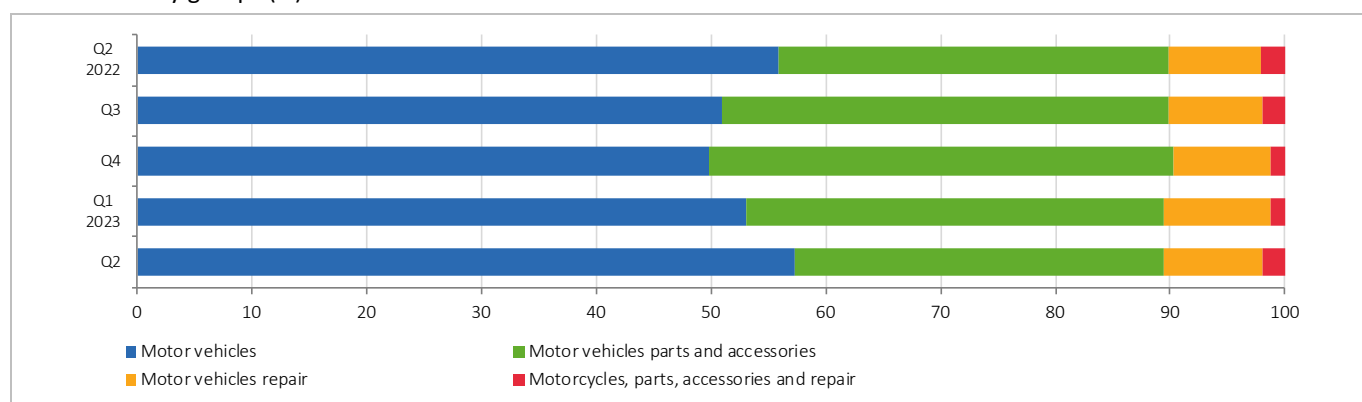
Turnover of goods in wholesale and retail trade and repair of motor vehicles in the second quarter 2023, relative to the same period 2022, recorded increase of 11.7% at current prices. In the first six months 2023, this division recorded increase of 12% relative to the same period 2022.

Table 6.3. Turnover in wholesale and retail trade and motor vehicles repair, indices
(comparison with the same period of the previous year)

	2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Current prices	111.1	138.4	113.6	116.1	124.5	124.8	118.8	121.3	112.5	111.7

Observed by trade divisions and commodity groups, in the second quarter 2023, similarly as in the previous quarters, in the structure of wholesale and retail trade turnover and motor vehicles repair, the most notable were motor vehicles (57.3%), and motor vehicles parts and accessories (32.2%).

Chart 6.4. Structure of wholesale and retail trade turnover and motor vehicles repair by trade divisions and commodity groups (%)



NOTE:

Goods turnover indices of retail trade at constant prices are obtained by deflating the indices at current prices with appropriate consumer price indices, which exclude water (from public utilities systems), electricity and motor vehicles, motorcycles, and parts thereof.

7. PRICES

In the first six months of 2023, consumer prices saw an average year-on-year growth of 15.3%. Products that had the largest influence on the growth of total consumer prices were: **dairy products, vegetables, meat, electricity for households, bread and cereals and solid fuels (fuelwood)**. Such order of the groups of products can briefly describe the core of consumer price inflation in the first six months of 2023.

Table 7.1. Consumer prices, year-on-year inflation rate (%) (quarter to the same quarter of the previous year)

	2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Consumer prices	8.7	10.6	13.3	15.1	16.0	14.5	-	-

Chart 7.1. Inflation rate measured by consumer price indices (%) (monthly – month to the previous month; annually - month to the same month of the previous year)

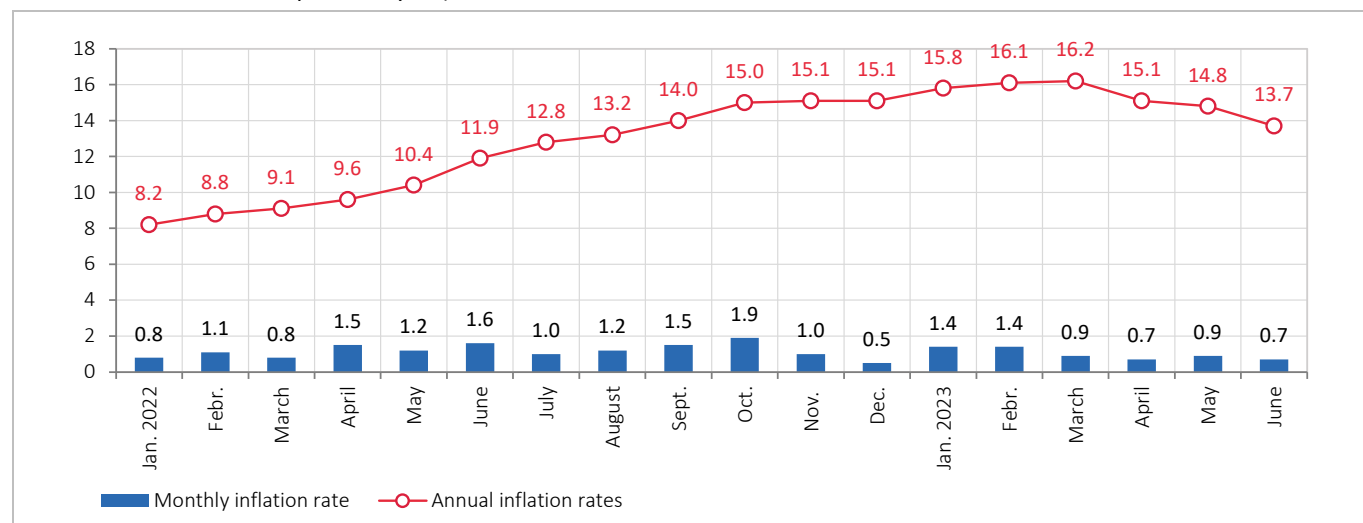
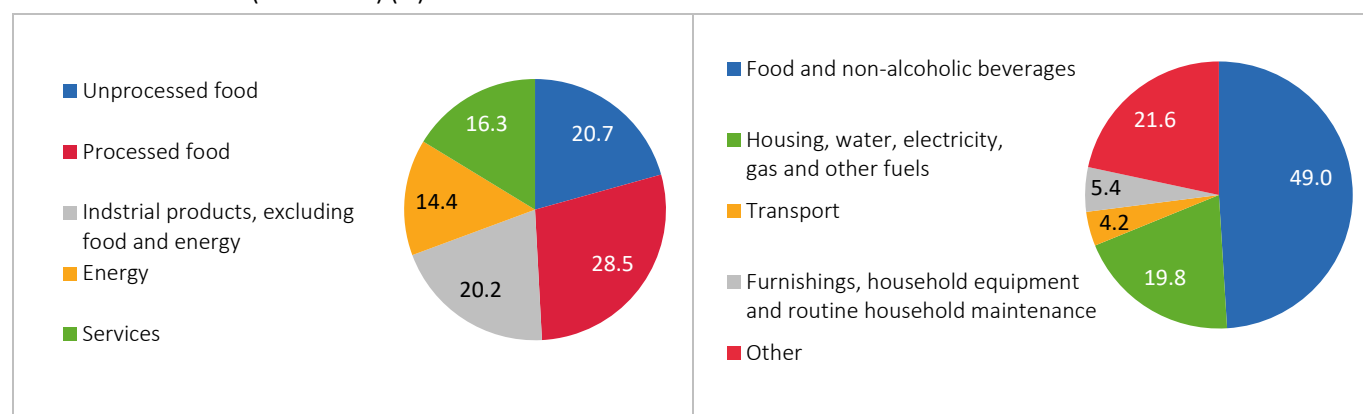


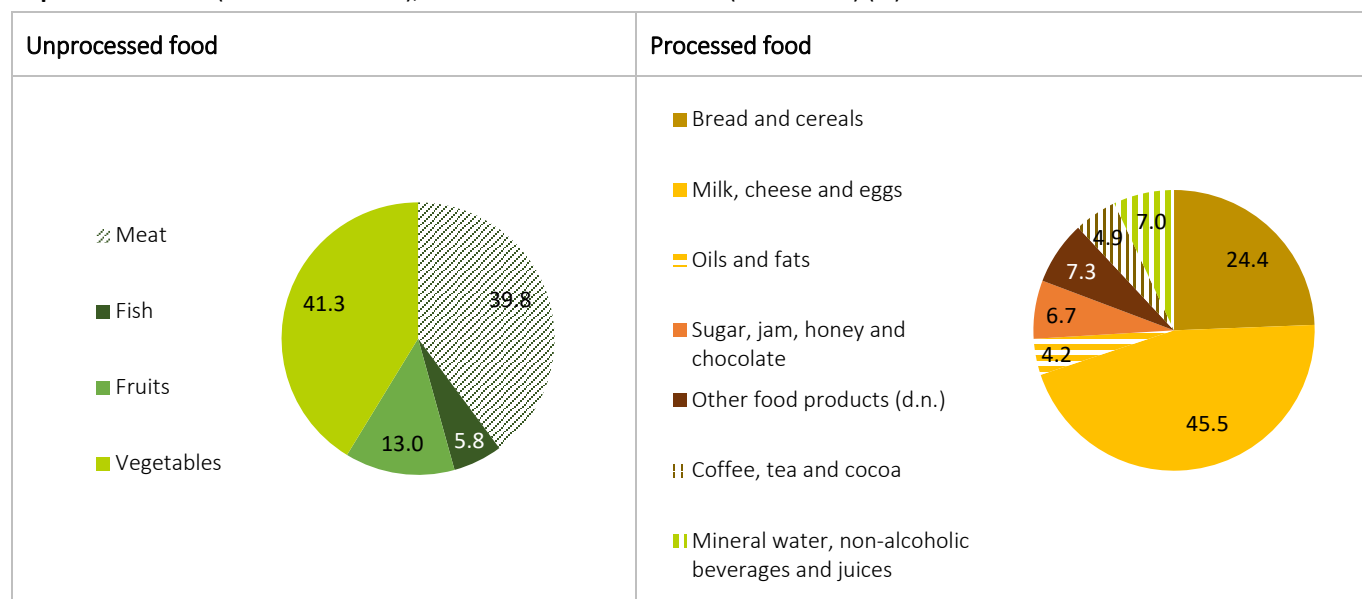
Chart 7.2. Structure of the average annual growth rate of consumer prices (15.3%) by purpose and main groups of products, first six months 2023. (total = 100) (%)



7.1. DAIRY PRODUCTS, VEGETABLES, MEAT, BREAD AND CEREALS

(share of the annual consumer price growth rate in the first six months 2023 – 36.6%)

Chart 7.3. Structure of the **average annual growth rate** of consumer prices of **unprocessed food** (the first chart) and **unprocessed food** (the second chart), the first six months of 2023 (total = 100) (%)

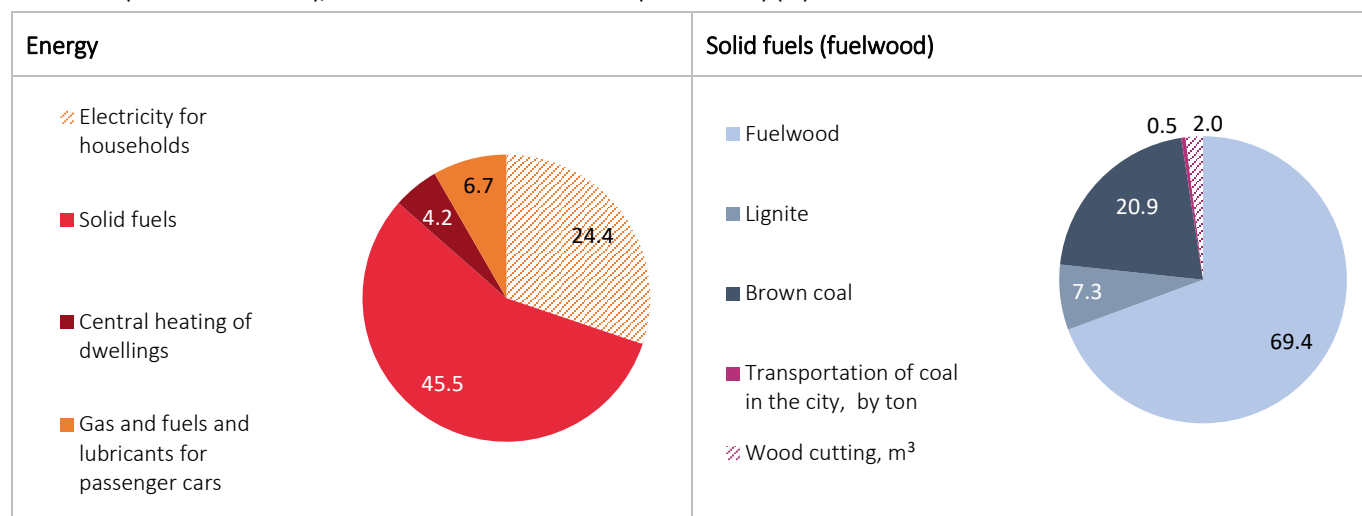


In the first half of 2023, **the year-on-year growth of total consumer prices was mostly influenced by the growth of the prices of dairy products (39.1%)**, primarily because the price of yoghurt (yoghurt, fruit yoghurt, with added cereals, kefir, etc.), fresh cheese (all kinds) and milk (with a shelf life up to 21 days) went up, accounting for 13.1% of total consumer price growth in the first half of 2023. In the first six months of 2023 the year-on-year **growth of the prices of vegetables 30.7%** was dominantly determined by the price of onions, potatoes (particularly red ones), paprikas, tomatoes and carrots. After the first half of 2023, cabbage was the only vegetable that had a deflationary effect on the total price of vegetables, by one percentage point less. The increase in the prices of **meat of 18.4%** was mostly under the influence of the growth of the price of boneless pork lard of all kinds, boneless beef and veal, sausages of pork or mixed meat, and chicken fillets, which total share in the structure of the annual growth rate was 48.6% in the first half of 2023. The year-on-year growth of the prices of **bread and cereals (21.8%)** was mostly generated by the growth of the price of white bread, salty snacks (salty bars, smoki, pretzels, etc.), burek, salty pies and cakes, accounting for 63.8% of total growth of prices of bread and cereals in the first six months of 2023.

7.2. ELECTRICITY FOR HOUSEHOLDS AND SOLID FUELS - FUELWOOD

(share in the annual consumer price growth rate in the first six months of 2023 – 13.1%)

Chart 7.4. Structure of the **average annual growth rate of consumer prices of energy** (the first chart) and **solid fuels - fuelwood** (the second chart), the first six months of 2023 (total = 100) (%)



The year-on-year growth of the **group energy** in the first half of 2023 amounted to 13.6%. This growth was mostly generated by the growth of the price of electricity for households and price of fuelwood (solid fuels). The price of electricity for households has gone up twice (in January and May) since the beginning of 2023, which affected the annual growth in the first half of 2023, amounting to 21.4% and accounting for 7.2% of the total consumer price inflation growth rate 7.2%.

In the first half of 2023, in the structure of the year-on-year growth rate of **the prices of solid fuels** (37.8%), the growth of the price of fuelwood accounted for 71.0% of the total annual growth rates of fuels, while the rest was made of brown coal, lignite and price of coal transport and wood felling. **Producers' costs of the section Electricity, gas, steam and air conditioning supply** for domestic market in the same period had a year-on-year growth rate of 8.7%, while **producers' costs of Manufacture of wood products of wood, except furniture** for domestic market in the same period went up by 19.0% and were, on average, for the period (Q1 2014 – Q2 2023) ahead one quarter of the dynamic of fuelwood price.

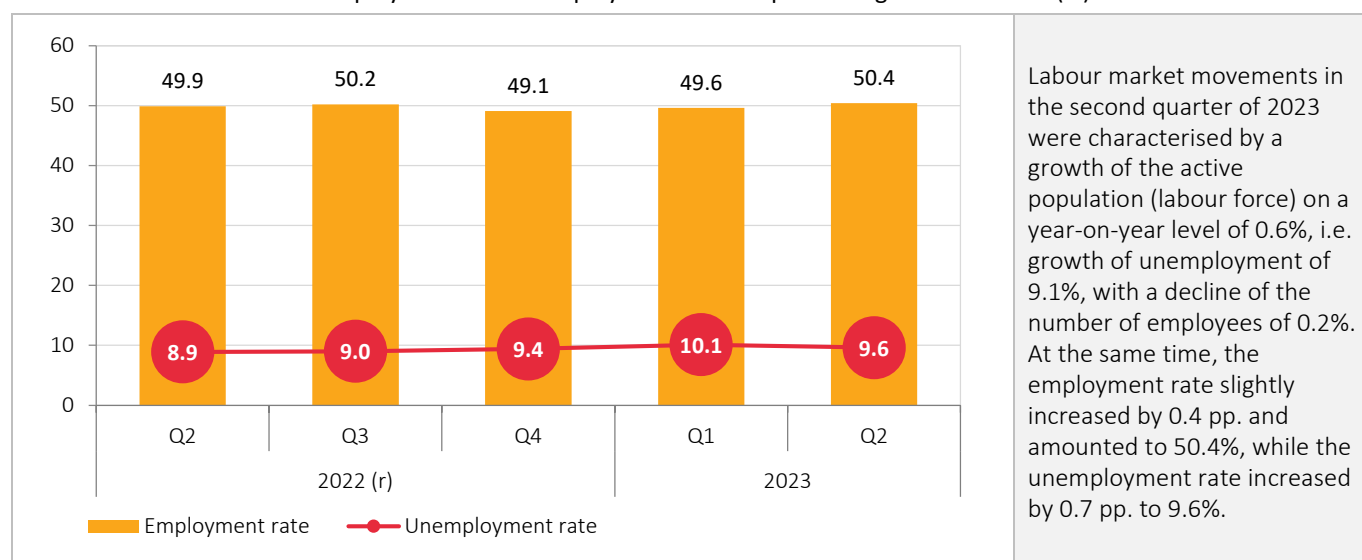
8. LABOUR MARKET

In the Republic of Serbia in the second quarter of 2023 there were 2.877 million persons employed 306.6 persons unemployed and 2.522 million outside the labour force aged 15 and over.

The employment rate was 9.6% and, compared with the first quarter of 2023, lower by 0.4 pp., the number of unemployed persons was down by 10.6 thousand, while the number of persons outside the labour force was down by 39.6 thousand.

Observed by regions, the unemployment rate in the second quarter of 2023, compared with the previous quarter, saw a fall in Region of Vojvodina (from 8.8% to 7.9%) and in Region of Southern and Eastern Serbia (from 14.9% to 13.8%), in Belgrade Region it fell slightly (from 7.6% to 7.7%), and in Region of Sumadija and Western Serbia it remained unchanged, 10.2%, compared with the first quarter of 2023.

Chart 8.1. Movement of the employment and unemployment rate for persons aged 15 and over (%)²¹



(r) – revised data²²

Table 8.1. Activity, employment and unemployment rates

	2022 (r)			2023		
	Q1	Q2	Q3	Q4	Q1	Q2
Activity rate (%)	54.4	54.8	55.1	54.2	55.2	55.8
Employment rate(%)	48.5	50.0	50.2	49.2	49.6	50.4
Unemployment rate (%)	10.9	8.9	9.0	9.4	10.1	9.6

²¹ Since 2021, the Statistical Office of the Republic of Serbia has been carrying out the Labour Survey according to the new, revised Eurostat methodology. The methodology has been modified in line with the Regulation of the European Parliament and European Council, which entered into force on 1 January 2021. More information on methodological changes and their effects on major statistical indicators are available on: <https://www.stat.gov.rs/vesti/20210628-anketa-o-radnoj-snazi-nova-metodologija/>

²² Estimates for the first and second quarters of 2023 were calculated on the basis of demographic estimates for 2022, according to the 2022 Census of Population, Households and Dwellings. Demographic estimates based on the 2011 Census were used to calculate estimates with the fourth quarter of 2022 included. For the purpose of data comparability from the first and second quarters of 2023 with those from 2022, a revision of LFS data was made on the basis of the revision of demographic estimates based on the 2022 Census. In the next months, based on the revised population data for the inter-census period, LFS data will be revised for the relevant period before 2022. Post-census revision was made in line with the General Revision Policy of the Statistical Office of the Republic of Serbia, which was fully harmonised with the ESS Guidelines on Revision Policy, which was adopted by the European Statistical System Committee. The objective of the post-census LFS data revision is to ensure comparability without interrupting time series.

Table 8.2. Labour market – persons aged 15 and over

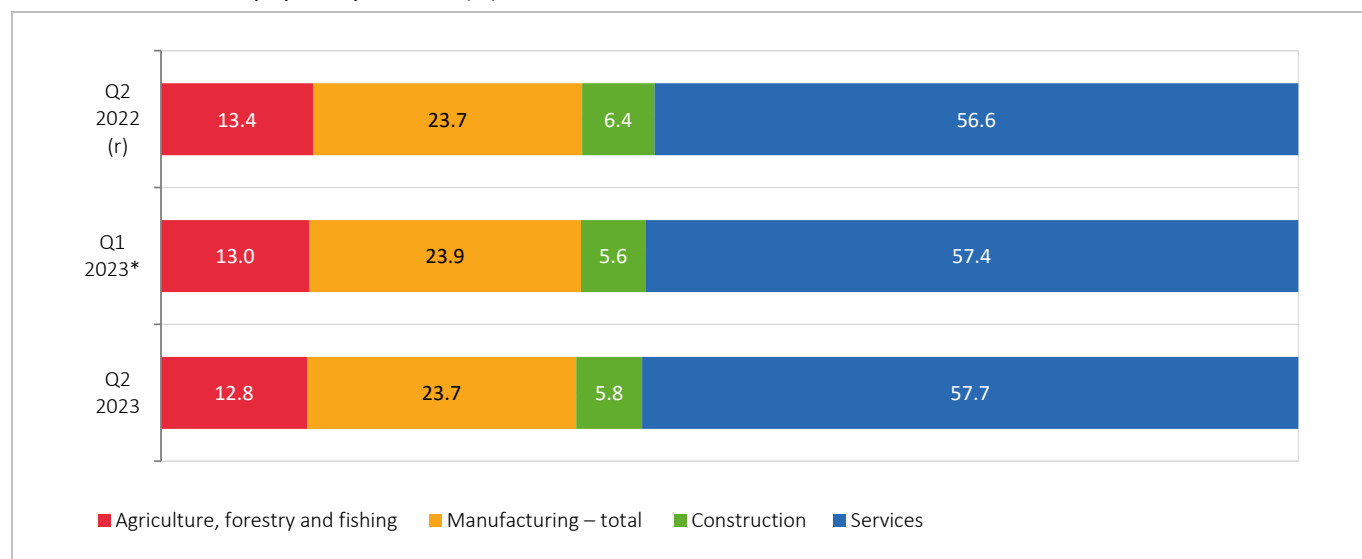
	Current quarter	Previous quarter (r)		The same quarter of the previous year (r)	
	Q2 2023 (in thous..)	Q1 2023 (in thous.)	Change, %	Q2 2022 (in thous.)	Change, %
Unemployment	306.6	317.2	-3.3	281.1	9.1
Employment	2 876.6	2 837.6	1.4	2 882.1	-0.2
	%	%	Change pp.	%	Change pp.
Unemployment rate	9.6	10.1	-0.5	8.9	0.7
Employment rate	50.4	49.6	0.8	50.0	0.4

(r) – revised data

Observed by sections, the largest share of the number of employed persons in the second quarter of 2023 was recorded in Services (57.7%), then in Manufacturing (23.7%) and Agriculture (12.8%), and the lowest in Construction (5.8%). When compared with the previous quarter, a fall of the share of employed persons was recorded in Agriculture, forestry and fishing (from 13 to 12.8%), and Manufacturing (from 23.9% to 23.7%). On the other hand, a growth of the share of persons employed was recorded in Services (from 57.4% to 57.7%) and Construction (from 5.6% to 5.8%).

In year-on-year periodicity (quarter II of 2023 – quarter II of 2022), a fall of the share of employed persons was recorded in Agriculture, forestry and fishing (from 13.4% to 12.8%), and Construction (from 6.4% to 5.8%), in contrast to Services where a growth was noted (from 56.6% to 57.7%).

Chart 8.2. Share of employees by sections (%)

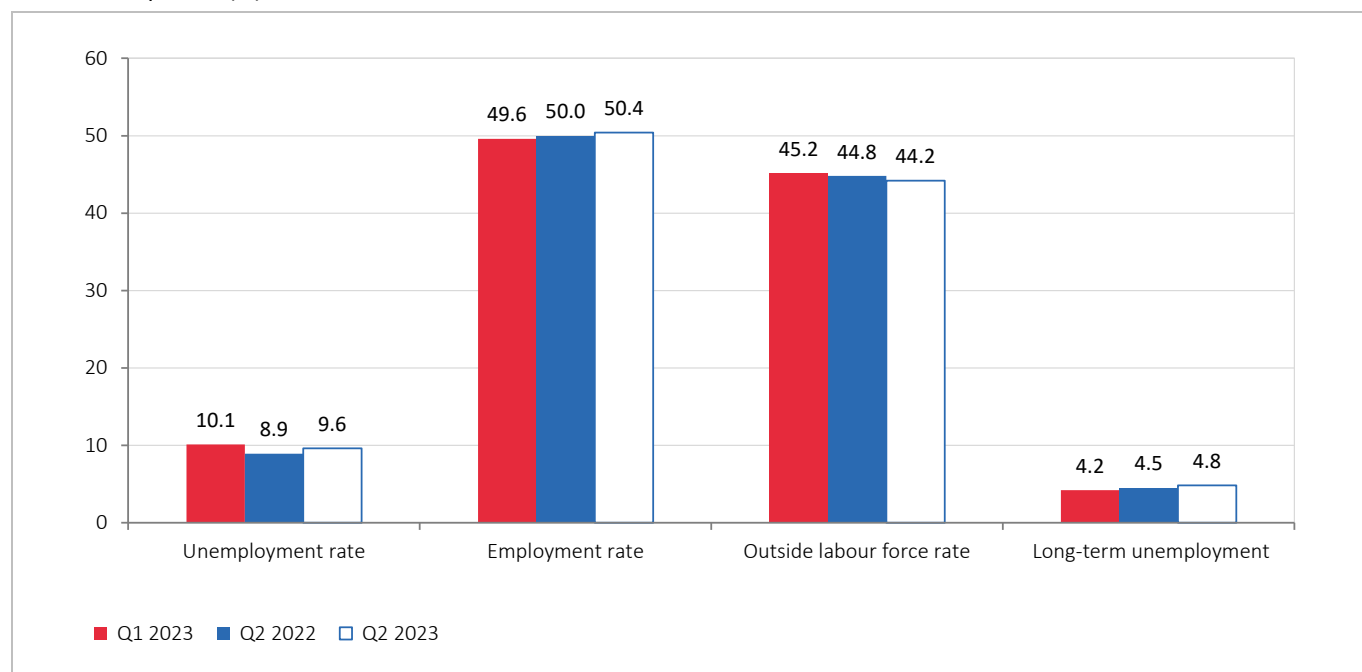


(r) – revised data

* For the first quarter of 2023, final data are provided, which replace the previously given results.

Trends in the labour market remained considerably resilient to the challenges in the global environment and to the slowing down of the dynamics of the economic activity, owing primarily to the macroeconomic stability established in the previous period.

Chart 8.3. Labour market – major indicators for the previous quarter, the same quarter of the previous year and the current quarter (%)



8.1. COMPARISON WITH THE PREVIOUS QUARTER

When compared with the previous, first quarter of 2023, the number of employed persons grew by 39 thousand, with a fall of unemployed persons of 10.6 thousand and fall of persons outside labour force of 39.6 thousand, which led to the increase in the employment rate of 0.8 pp., decrease in the unemployment rate by 0.5 pp., and decrease in the outside labour force population of 0.6 pp.

In the population of young people, aged 15–24, the same trends between quarters were recorded in the movement of the main population contingents, as well as in the total population. The fall of the rate of the population outside labour force of 0.3 pp. was followed by the growth of the employment rate (0.3 pp.) and fall of the unemployment rate (0.2 pp.).

The long-term unemployment rate amounted to 4.8%, by 0.6 pp. more than in the first quarter of 2023.

Observed by sex, the unemployment rate in the second quarter of 2023, compared with the previous quarter, saw a fall of 0.8 p.p. among men, while among women it remained unchanged when compared with the first quarter of 2023.

The unemployment rate among men increased only Belgrade Region from 6.8% to 8.7%, while the other regions saw a fall: in Region of Southern and Eastern Serbia, from 14% to 11.2%, Region of Sumadija and Western Serbia, from 9.9% to 9.5% and Region of Vojvodina, from 9.3% to 7.2%.

In contrast, as far as the unemployment rate among women is concerned, fall was recorded only in Belgrade Region, from 8.4% to 6.6%, while the other regions noted growth: in Region of Vojvodina, from 8.1% to 8.6%, Region of Southern and Eastern Serbia, from 16% to 17.2%, and in Region of Sumadija and Western Serbia, from 10.5% to 11.2%.

Observed by professional status, and compared with the previous quarter, the number of employed persons increased only in the category of self-employed (by 3.1%), and employed persons (by 1.9%), while the number of contributing family members fell 9.2%.

Table 8.3. Employment by professional status, comparison, поређење Q1 2023 – Q2 2023

	Q1 2023 (in thous.)	Q2 2023 (in thous.)	Change, %
Employed persons – total	2 837.6	2 876.6	1.4
Self-employed	455.1	469.1	3.1
Employed workers	2 209.7	2 250.6	1.9
Contributing family members	172.9	156.9	-9.2

8.2. COMPARISON WITH THE SAME QUARTER OF THE PREVIOUS YEAR

Compared with the same quarter of the previous year, the number of unemployed persons increased by 9.1% (from 281.1 thousand to 306.6 thousand). At the same time, the number of employed persons fell by 0.2% (from 2 882.1 in the second quarter of 2022 to 2 876.6 in the second quarter of 2023).

The youth unemployment rate (aged from 15 to 24) in the second quarter of 2023 amounted to 24.7%, by 6.4 p.p. more than in the second quarter of 2022, when it amounted to 18.3%.

The long-term unemployment rate recorded fall on year-on-year level. In the second quarter of 2023 it amounted to 4.8%, by 0.3% down relative to the second quarter of 2022.

Observed by sex, the unemployment rate in the second quarter of 2023, compared with the same quarter of the previous year, saw a growth among both women and men, by 0.3 pp. and 1.1 pp., respectively.

Observed by regions, the unemployment rate among men saw a fall in almost all the regions: in Belgrade Region from 7.4% to 8.7%, Region Southern and Eastern Serbia, from 7.6% to 11.2% and in Region of Sumadija and Western Serbia from 8.9% to 9.5%, with the exception of Region of Vojvodina, where a slight fall was recorded (from 7.8% to 7.2%).

The unemployment rate among women recorded a fall: in Belgrade Region from 7.4% to 6.6% and Region Sumadija and Western Serbia, from 13.5% to 11.2%, while, contrary to that, a growth of the unemployment rate was recorded in Region of Southern and Eastern Serbia, from 12.4% to 17.2% and Region of Vojvodina, from 7.3% to 8.6%.

Observed by professional status, compared with the same quarter of 2022, the number of employed persons increased only in the category of employees (by 0.2%), while the categories of self-employed and contributing family members saw a fall of 1.5% and 1.4%, respectively.

Table 8.4. Employment by professional status, comparison Q2 2022 – Q2 2023

	Q2 2022 (in thous.)	Q2 2023 (in thous.)	Change, %
Employed persons – total	2 882.1	2 876.6	-0.2
Self-employed	476.2	469.1	-1.5
Employed workers	2 246.8	2 250.6	0.2
Contributing family members	159.1	156.9	-1.4



GLOSSARY

Active population (labour force) comprises all employed and unemployed persons aged 15 and 24.

Employed persons are persons aged 15-89 and over who performed a paid job for at least one hour in the reference week (in cash or in kind), as well as persons who had an employment but who were absent from work in that week. According to the Classification of Employment Status, they are divided into *self-employed*, *employed* and *contributing family member*.

Self-employed are persons working solely in their own enterprise, institution, privately- owned store or on an agricultural holding, as well as persons performing solely a professional activity or any other job for own account. Self-employed are persons who solely define the conditions of their work (as well as of their employees) and bear the risk for their work.

Employed workers are persons who work for an employer in any ownership sector, whether having a formal employment contract or working on an oral contract. Family members who help in performing family business and are paid for their work are considered employed workers.

Contributing family members are persons who help another family member in running family business or agricultural holding, and are not paid for that work. Those persons are considered employed even if they are not paid for their work because they have benefits, such as accommodation, food, etc.

Unemployed persons are persons aged 15-74 who did not perform any paid job in the reference week, sought actively a job during four weeks preceding the reference week, and who were ready to start working within two weeks after the reference week.

Outside labour force population comprises all persons aged 15 and more who are classified in the employed or unemployed population. Inactive persons include students, retired persons, houseworkers, as well as all persons who did not perform in the reference week any paid job, did not actively seek employment or were not able to start working within two weeks after the end of the reference week.

Activity rate is the share of active population in the total population aged 15 and over.

Employment rate is the share of employed persons in the total population aged 15 and over.

Unemployment rate is the share of unemployed persons in the total number of active population aged 15 and over.

Long-term unemployment is the share of persons being unemployed more than a year in the labour force (the employed and unemployed) aged 15 and over.

Outside labour force rate is the percentage of inactive population in the total population aged 15 and over.

9. SALARIES AND WAGES

Average net salaries and wages calculated in the Republic of Serbia for the second quarter of 2023 amounted to 85 192 dinars.

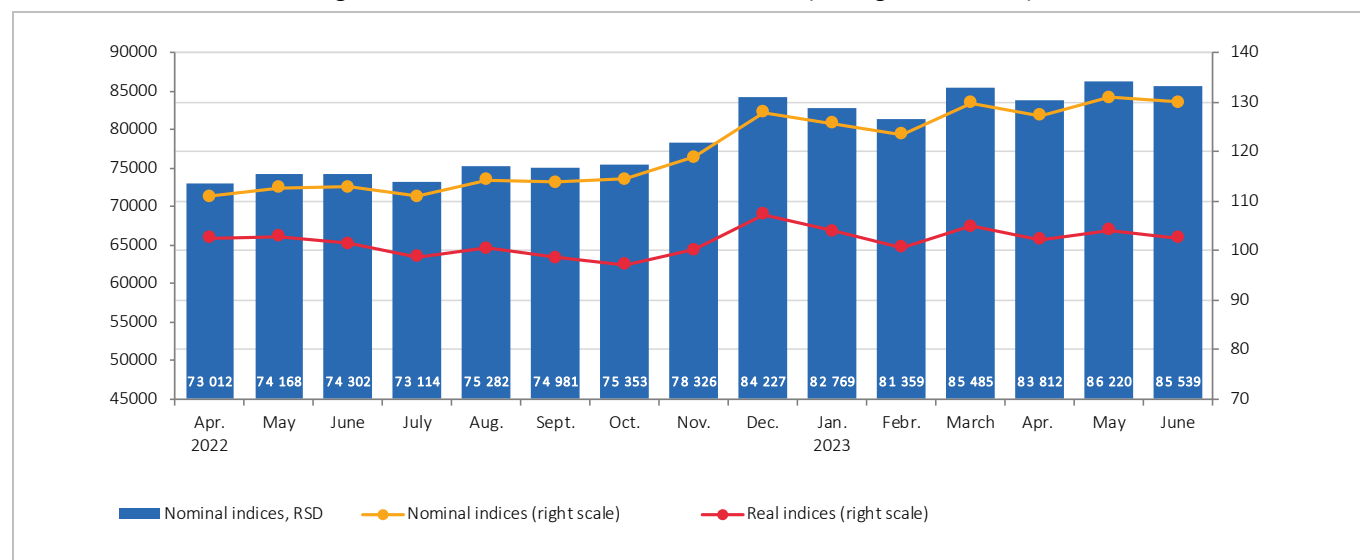
Compared with the same period of the previous year, there were nominally up by 15.4% and by 0.8% in real terms. Compared with the previous, first, quarter of 2023, there were nominally up by 2.4%, but down by 0.2% in real terms.

For the first six months of 2023, calculated average net salaries and wages amounted to 84 204 dinars, and in relation to the same period of the previous year increased by 15.4% and by 0.1% in real terms.

Table 9.1. Net salaries and wages - real and nominal indices (comparison with the same period of the previous year)

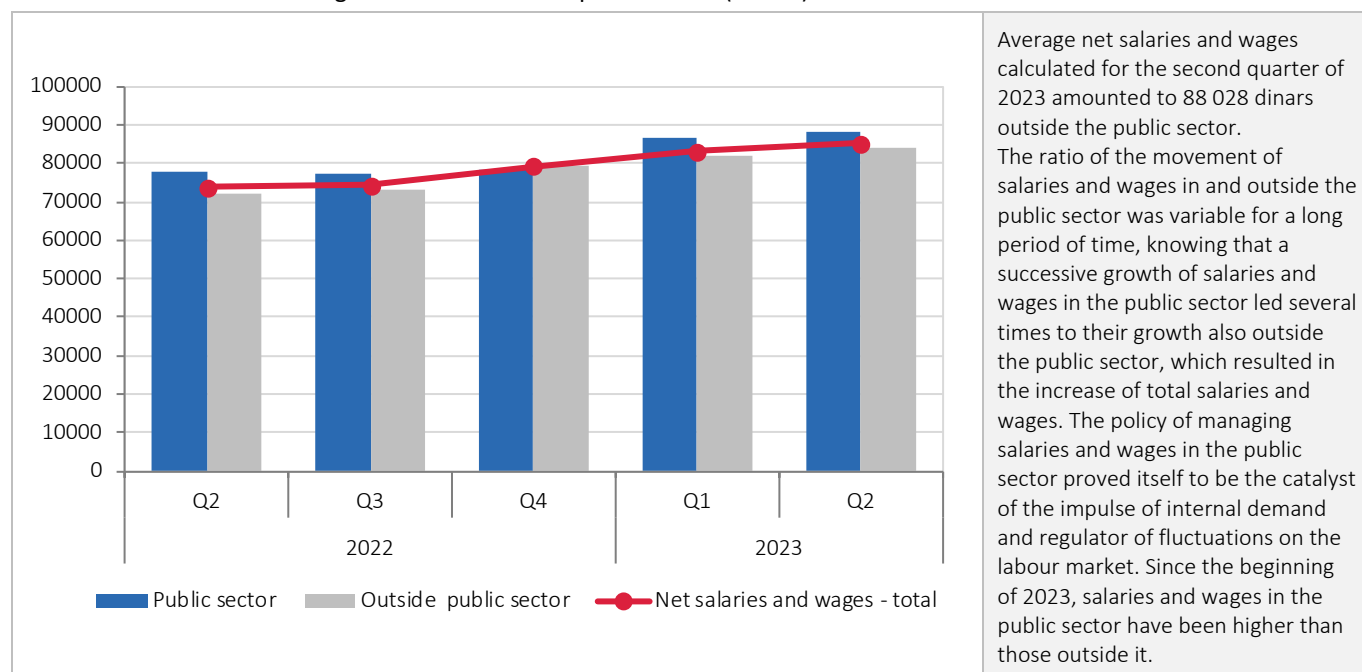
	2020				2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Real indices	108.3	107.4	107.4	107.6	105.8	106.4	104.5	104.5	104.3	102.7	101.3	98.6	99.6	100.8
Nominal indices	110.3	108.5	109.4	109.3	107.3	109.8	109.2	112.1	113.4	113.6	114.8	113.4	115.5	115.4

Chart 9.1. Net salaries and wages, movement of nominal and real indices (average 2021 = 100)



Since the beginning of the year, nominal salaries and wages have followed the real economy and budget, adapting themselves at the same time to trade indicators, i.e. offer and demand for labour force. Average net salaries and wages recorded also an ascending trend in June 2023 amounting to RSD 85 539, reaching a year-on-year growth of 15.1% nominally, and of 1.2% in real terms. The decision on increasing the minimal pay from 201.2 dinars per hour of work in 2022 to 230 dinars in 2023 influenced the growth of salaries and wages. Average net salaries and wages, expressed in euros, as an indicator of living standard and international economic competitiveness of the Republic of Serbia, recorded growth also in June 2023, reaching a value of EUR 729 or year-on-year growth of 15.2%, which is close to the nominal growth of salaries and wages due to the relative stability of the exchange rate of RSD to EUR.

Chart 9.2. Net salaries and wages in and outside the public sector (in RSD)



Average net salaries and wages in the public sector
(January-June 2023)

Public sector – total	RSD 87 355
Public government enterprises	RSD 97 000
Public local enterprises	RSD 77 938
Administration - all levels	RSD 94 144
Government level	RSD 98 265
Autonomous province level	RSD 102 914
Local authorities level	RSD 73 443
Human health and social work	RSD 86 434
Education and culture	RSD 79 455

When comparing net salaries and wages by CA (2010), one notices that the largest real growth in the first half of 2023 to the same period of 2022, was realised in the sections Retail and wholesale trade and repair of motor vehicles (1.1%), Manufacturing and Arts, entertainment and recreation (1%).

The highest net salaries and wages in the first two quarters of 2023 was recorded in the following divisions: Computer programming and consultancy activities (257 994 dinars), Air transport (190 144 dinars), Scientific research and development activities (177 543), Extraction of crude petroleum and natural gas (152 704), and Financial services, except insurance and pension funding (144 092).

In all other divisions salaries and wages ranged from 46 722 dinars (Food and beverages service activities) to 137 195 dinars (Mining support activities and geological surveying).

Observed by regions, the highest average net salaries and wages in the first half of 2023 were paid in Belgrade Region, 106 746 dinars. In Region Vojvodina average salaries and wages totaled 79 690 dinars, in Region of Southern and Eastern Serbia, 72 399 dinars, and they were the lowest in Region of Sumadija and Western Serbia, 70 165 dinars

Chart 9.3. Real growth of net salaries and wages by sections of CA (2010)

(January-June 2023 to the same period of 2022)

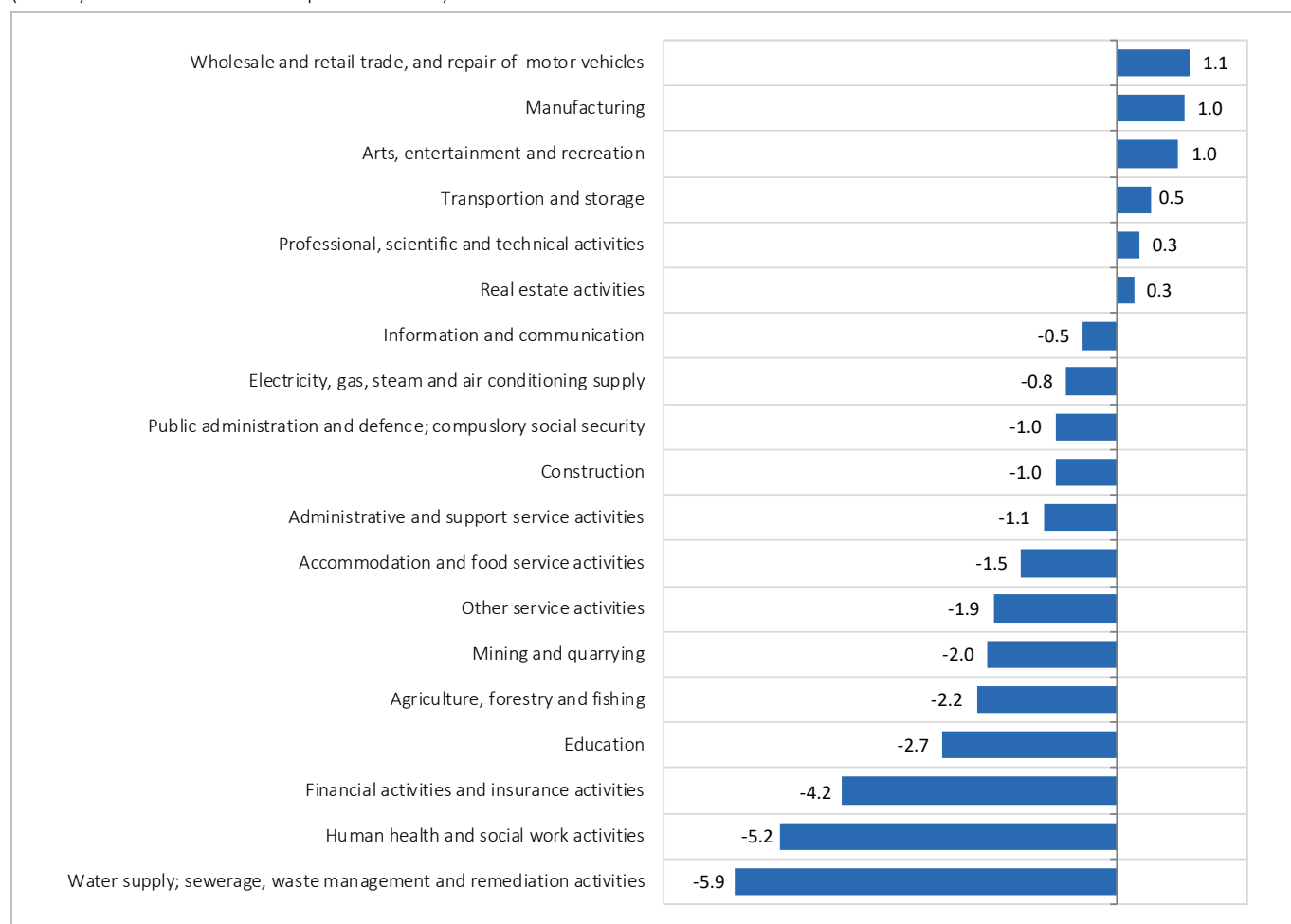
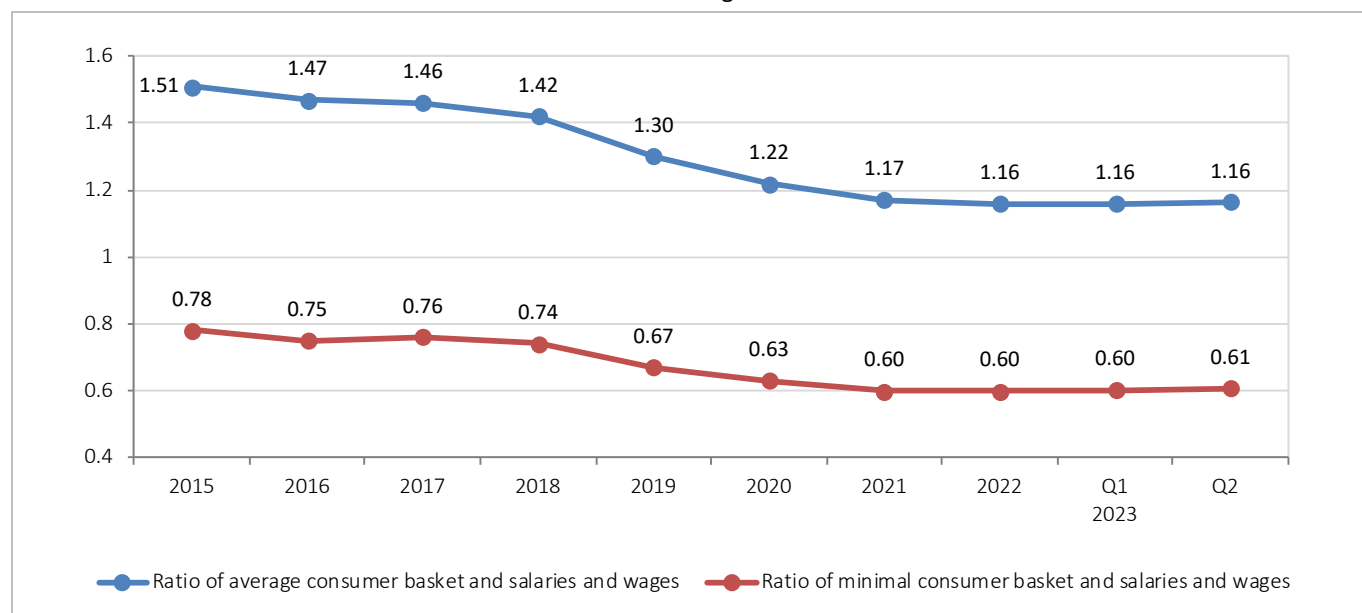


Chart 9.4. Ratio of the consumer basket²³ and net salaries and wages



Increased population living standard over 2015–2022 is primarily the result of a dynamic growth of salaries and wages. In 2015, the ratio of the average consumer basket and average net salaries and wages was 1.51, while in 2022 it was 1.16, indicating that, while in 2015, 1.51 of the average salaries and wages was needed for the average consumer basket, in 2022 this ratio grew so that 1.16 of the average salaries and wages was necessary for the average consumer basket.

The ratio of net salaries and wages and average consumer basket in the second quarter of 2023 indicates that the purchasing power grew slightly, when compared with the previous quarter. To cover the average consumer basket in the second quarter of 2023, 1.16 average salaries and wages were needed, as well as in the previous quarter, and to cover the minimum consumer basket only 0.61 of average salaries and wages (in the first quarter - 0.60).

When compared to the same quarter of the previous year, the ratio of the average consumer basket and net salaries and wages of 1.16 indicates a fall of the purchasing power (in the second quarter of 2022 – 1.15), while the minimum average consumer basket of 0.61 of average salaries and wages exceeds the level from the same quarter of the previous year (0.59).

Observed by towns, in the second quarter of 2023, purchasing power (ratio of the average consumer basket and average salaries and wages) above the average of the Republic (1.16) was recorded in Belgrade (0.95), Novi Sad (1.12) and Nis (1.14), while Kragujevac (with 1.16) is on the level of the national average. In other statistically monitored towns, average salaries and wages covered the minimum, but not average household consumer basket.

²³ Minimum consumer basket – refers to household consumption, which provides for basic living and working capacity of household members, bearing in mind the optimal biochemical composition of food (carbohydrates, proteins, fats and calories). The total value of the minimum consumer basket is the sum of expenses for food and other products and services making up individual household consumption.

Average consumer basket – refers to the consumption of products and services of the individual consumption of an average household.

Since January 2011 New Average and New Minimum Consumer Basket have been published, which are calculated starting with January 2008 according to the new methodology of the Statistical Office of the Republic of Serbia.

10. TOURISM

Tourism, having a multidimensional and complex nature, is an activity intertwined with many other economic activities, as, besides, providing accommodation and food services, the indispensable activities related to tourism are the following ones: transport, cultural and recreational activities, payment operations, etc. It not only promotes and forms the national identity of a country but it also plays a big role in its economy — in some regions it is even the only factor for creating employment for the local population, and generally, the only factor of sustainable development — all the reasons to deserve special analytical attention.

10.1. TOURIST OVERNIGHT STAYS

Tourism in the Republic of Serbia started its expansion in 2015, primarily by means of incentive measures of domestic tourism, but also by increased interest of foreign tourists in this period. Expressed in number of overnight stays, tourist turnover was going up until 2019, when a record number of 10.1 million overnight stays was achieved. The year 2020 brought contraction of tourism activity and a fall of the number of overnight stays of 6.2 million, where domestic tourists spent almost 5 million, and foreign ones about 1.3 nights. The year 2021 brought recovery and the number of overnight stays grew by 8.2 million. The increasing trend expressed in the number of tourist overnight stays in the Republic of Serbia continued also in the previous 2022, when there were 12,2 million overnight stays, 50% more than in 2021. Even though domestic tourists were predominant in the number of overnight stays, there were twice more foreign tourists in our country (4.9 million) than in 2021.

In the second quarter of 2023, the number of spent tourist nights amounted to 3.1 million, by 6.6% more than in the second quarter of 2022. Domestic tourists accounted for 55.1% and foreign ones for 44.9% of the total number of overnight stays.

Chart 10.1. Tourist overnight stays – domestic, foreign and total; quarterly and annual data

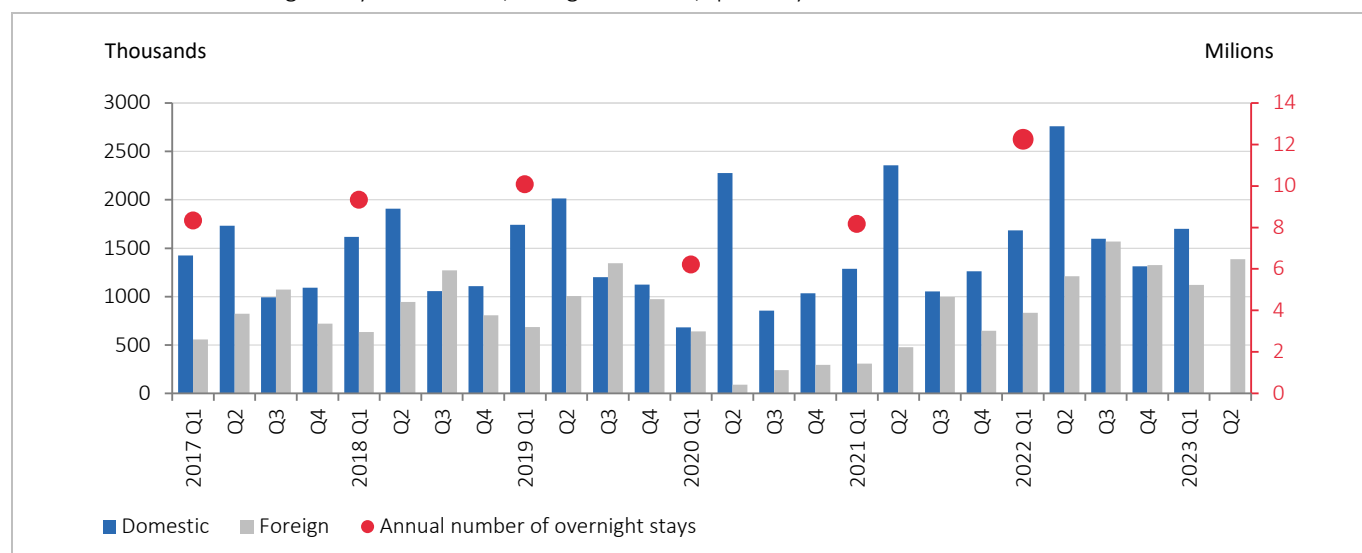


Table 10.1. Tourist overnight stays, indices (comparison with the same period of the period year)

	2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Total	76.1	228.4	133.3	148.2	156.3	164.1	129.2	171.7	116.0	106.6
Domestic tourists	91.9	188.5	103.6	123.5	122.2	130.8	117.2	151.4	103.9	100.8
Foreign tourists	48.3	535.8	412.6	220.0	270.1	253.8	157.5	204.7	134.4	114.5

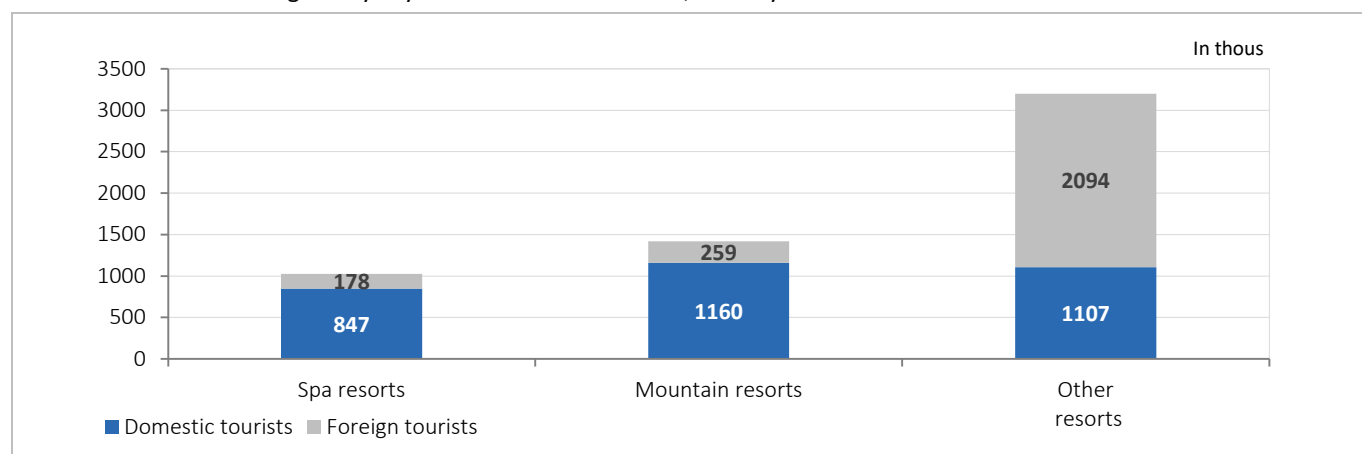
10.2. MAJOR TOURISM RESORTS

Expressed in number of tourist overnight stays²⁴, the most frequently visited tourism resorts in the first six months of 2023 were **Other tourism resorts**, with 3.2 million overnight stays (or about 56.7% of total overnight stays), by 15.4% more than in the same period of 2022. This category comprises Belgrade (1.6 thousand overnight stays) and larger towns of the Republic of Serbia (Novi Sad, Subotica, Nis). Most of the visitors to Belgrade were foreign tourists (85.6%), and a similar situation was recorded in Novi Sad (foreign tourists 70%) and Subotica, where about 53.8% of visitors were from abroad.

In Mountain resorts, second category according to the number of tourist overnight stays, in the first six months of 2023 there were 1.4 million overnight stays (or 25.1% of the total number of overnight stays), by 5.3% more than in the same period of the previous year. Zlatibor attracted the largest number of tourists (468.2 thousand), who were mostly from the Republic of Serbia (366.8 thousand). Kopaonik recorded 360.4 thousand tourist overnight stays, of which most were also from the Republic of Serbia (263 thousand). These two mountains accommodated about 58.4% of the total number of tourists who spent nights in mountain resorts

In spa resorts in the first six months of 2023 there were about 1 million overnight stays, by 2.4% more than in the same period of the previous year. Tourists were mainly from the Republic of Serbia (82.7%), and the most visited was Vrnjacka banja with 269.3 thousand visitors, followed by Sokobanja (204.5 thousand), Banja Vrdnik 83.6 thousand), Banja Koviljaca (77.2 thousand), and other spas.

Almost all tourism resorts saw a growth of the number of tourist overnight stays in the first six months of 2023 in relation to the same period of 2022, and mostly in Rudnik (growth of 553.5%), Goc (growth of 130.2%), Novopazarska banja (growth of 129.6%) and Becej (growth of 101.3%).

Chart 10.2. Tourist overnight stays by selected tourism resorts, January-June 2023

²⁴ The sum of data by type of resorts (spas, mountains, other resorts) does not give the correct number of tourist overnight stays in the Republic of Serbia knowing that the areas of some tourist resorts belong at the same time to different resorts (e.g. they are at the same time spa and mountain resorts).

10.3. COUNTRIES OF ORIGIN OF FOREIGN TOURISTS

In the period January-June 2023, tourists from about fifty different countries visited the Republic of Serbia. Tourists from Europe were the most numerous to have spent nights (83%)

Three countries which tourists spent the largest number of nights were the Russian Federation (346.4 thousand), Turkey (217 thousand), and Bosnia and Herzegovina (166.8 thousand). Visitors from North Macedonia were at the fourth place (140.6 thousand), then from China (130.3 thousand), Germany (117 thousand) and Romania (113.6 thousand). Overnight stays of tourists from these seven countries account for almost a half of the total number of nights spent in the first half of 2023.

For the purpose of comparison, chart 10.4 presents the number of tourist overnight stays in in first six months of 2022.

Chart 10.3. Foreign tourist overnight stays by countries from which they came from, January-June 2023

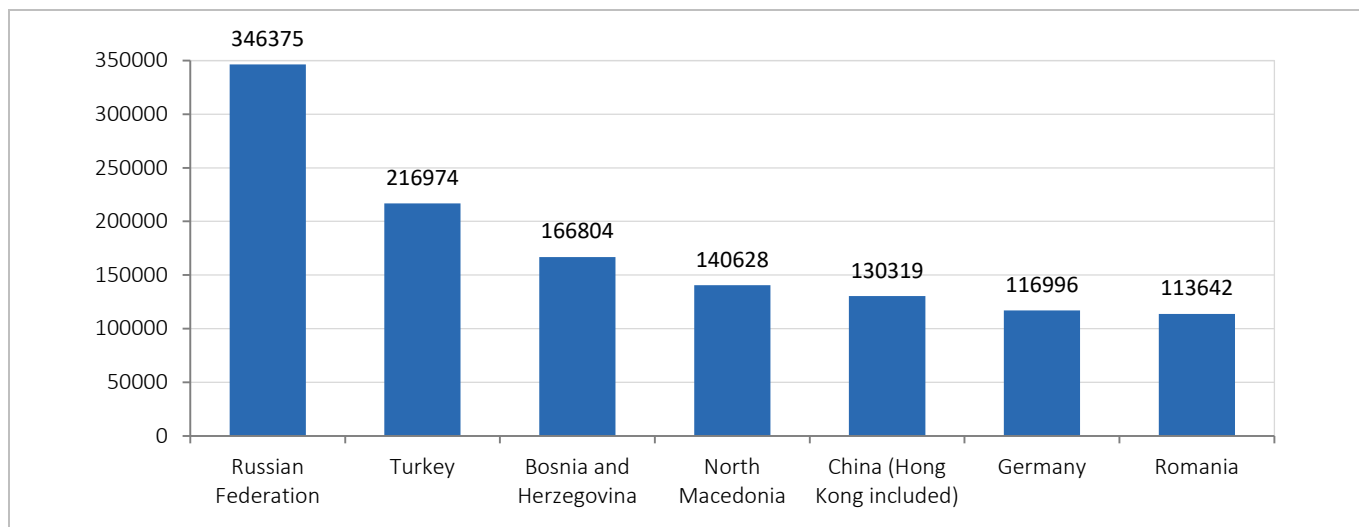
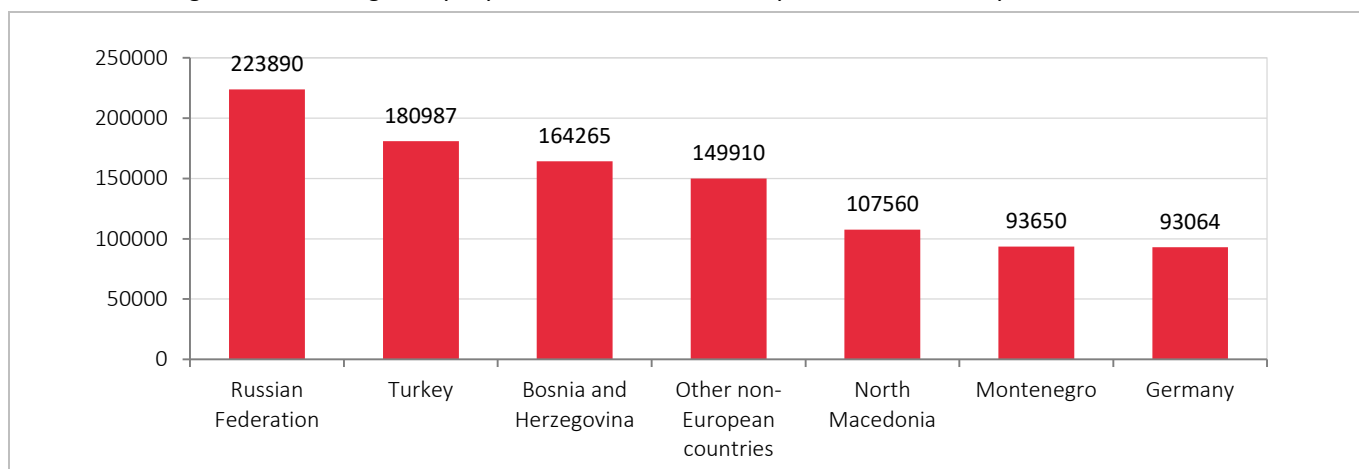


Chart 10.4. Foreign tourist overnight stays by countries from which they came from, January-June 2022.



 Note: in all the publication of the Statistical Office of the Republic of Serbia. Since 2022, data on tourism turnover have been published on the basis of the processing of data retrieved from the administrative source, Central Information System in Catering and Tourism (eTourist). Until December 2021 included, data were collected, processed and published on the basis of a statistical survey on tourist arrivals and overnight stays in accommodation facilities (TU-11). All indices of tourism turnover (tourist arrivals and overnight stays) in 2022 are calculated based on the data of the Central Information System in Catering and Tourism (eTourist) for 2022 and 2021. With the change of data source, and therefore of the coverage, the survey-based results (TU'-11, for the previous year) and those from the administrative source (eTourist) are not comparable.

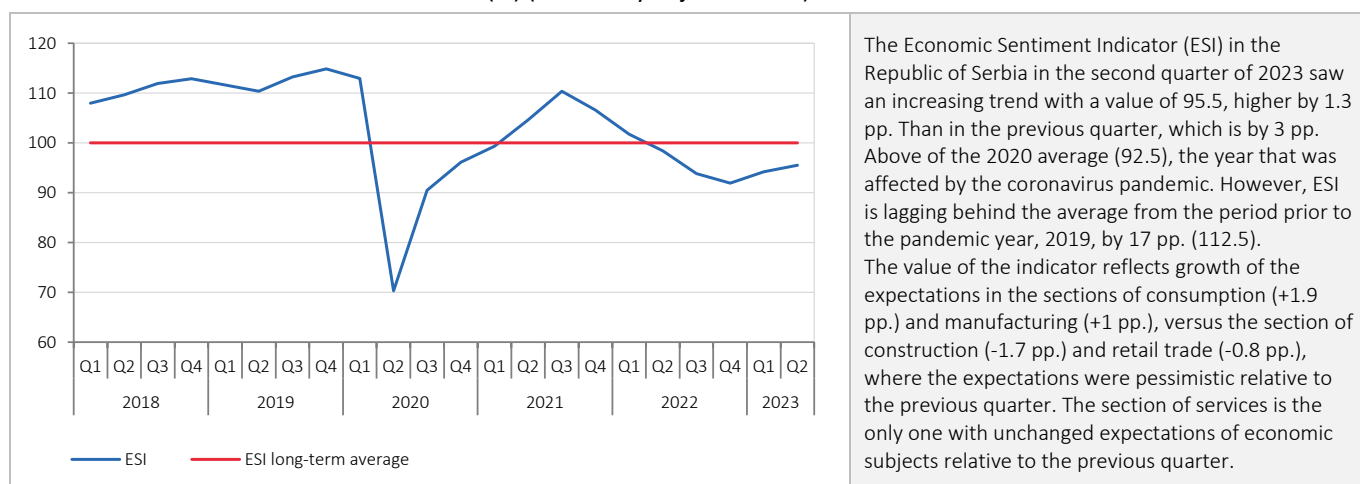
11. ECONOMIC SENTIMENT INDICATOR

11.1. ECONOMIC SENTIMENT INDICATOR - ESI

Economic Sentiment Indicator – ESI is a composite indicator which purpose is to present producers' and consumers' perceptions about economic movements and economic stability. As expectations of business subjects can be an important signal of changes in economic trends, this indicator is used to assess economic situation, make flash estimates, for scientific and analytical use, as well as for international comparisons and creating economic policies.

ESI has been developed by the General Directorate for Economic and Financial Affairs of the European Commission (DG ECFIN). It is obtained through five different surveys of producers and consumers, which attitudes provide a reliable indication of economic movements, based on which confidence indicators are created. Confidence indicators of the analysed sections are weighted in order to reflect as good as possible their influence on economic activity – manufacturing 40%, service activities 30%, household consumption 20%, construction 5% and retail trade 5%. A value of ESI index exceeding 100 indicates improvement or economic activity, while that below 100 suggests decline.²⁵

Chart 11.1. Economic Sentiment Indicator²⁶ (%) (seasonally adjusted data)



Source: European Commission, processing: Statistical Office of the Republic of Serbia. Quarterly data represent the quarterly average.

Table 11.1. Confidence indicators by sections of the Economic Sentiment Indicator - growth to the long-term average (%)

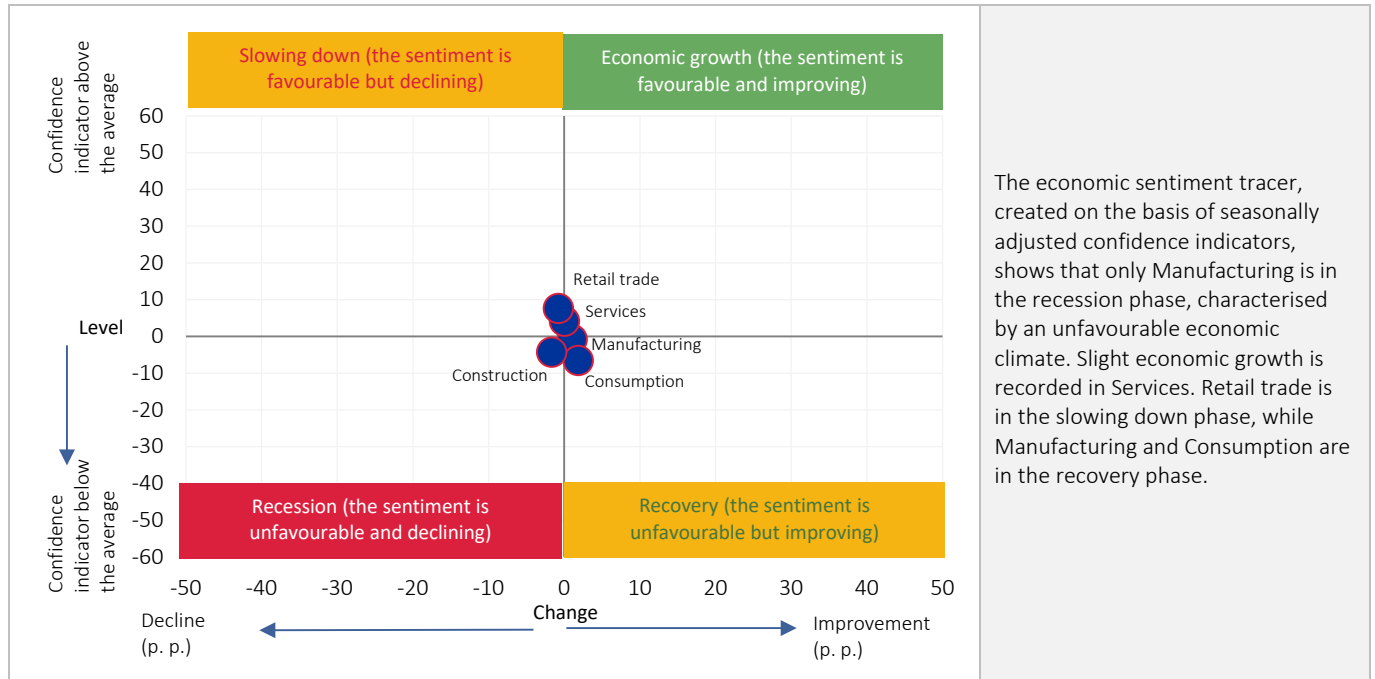
Confidence indicators	Minimum		Average	Maximum		2022				2023	
	Quarter	Value		Quarter	Value	Q1	Q2	Q3	Q4	Q1	Q2
Manufacturing	Q2 2020	-9.4	3.6	Q3 2018	8.0	0.4	1.4	0.9	-0.7	-1.8	-0.8
Services	Q2 2020	-43.1	6.5	Q2 2016	16.1	7.4	5.9	1.3	3.4	4.2	4.2
Retail trade	Q4 2014	-20.6	-5.0	Q1 2020	10.7	2.3	-6.0	-12.3	-17.2	-8.4	-6.5
Construction	Q2 2020	-12.6	8.2	Q4 2019	17.7	9.7	8.0	7.2	6.1	8.4	7.6
Consumption	Q3 2013	-40.9	-10.3	Q3 2019	6.9	-0.9	-6.0	-8.1	-2.9	-2.6	-4.3
<i>Economic Sentiment Indicator</i>	<i>Q2 2020</i>	<i>70.3</i>	<i>102.4</i>	<i>Q4 2019</i>	<i>114.9</i>	<i>101.8</i>	<i>98.4</i>	<i>93.8</i>	<i>91.1</i>	<i>94.2</i>	<i>95.5</i>

²⁵ is calculated as an index with a mean value of 100 and standardised deviation of 10. More on the methodology on:

https://economy-finance.ec.europa.eu/system/files/2023-02/bcs_user_guide.pdf

²⁶ Data for the Economic Sentiment Indicator (ESI) have been revised in line with the improved methodology of data seasonal adjustment, which has been in use since April 2022 as well as with regular annual methodological adjustments.

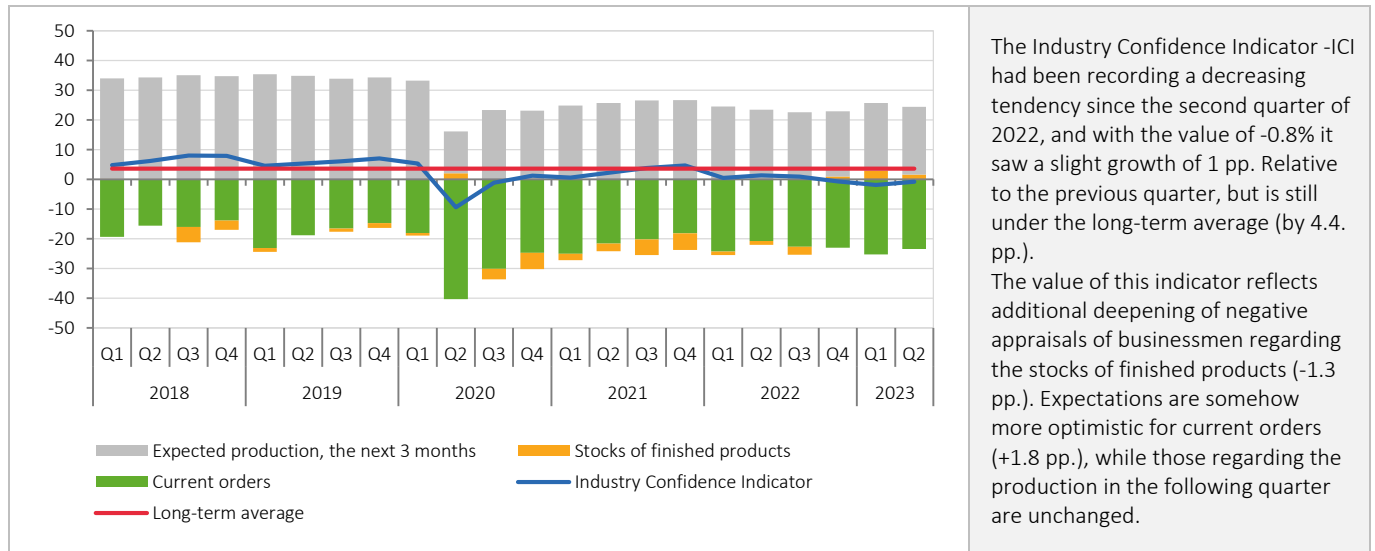
Chart 11.2. Economic sentiment tracer



11.2. INDUSTRY CONFIDENCE INDICATOR

The industry confidence indicator includes the responses of economic subjects on contracted orders, expected production and stocks of finished products.

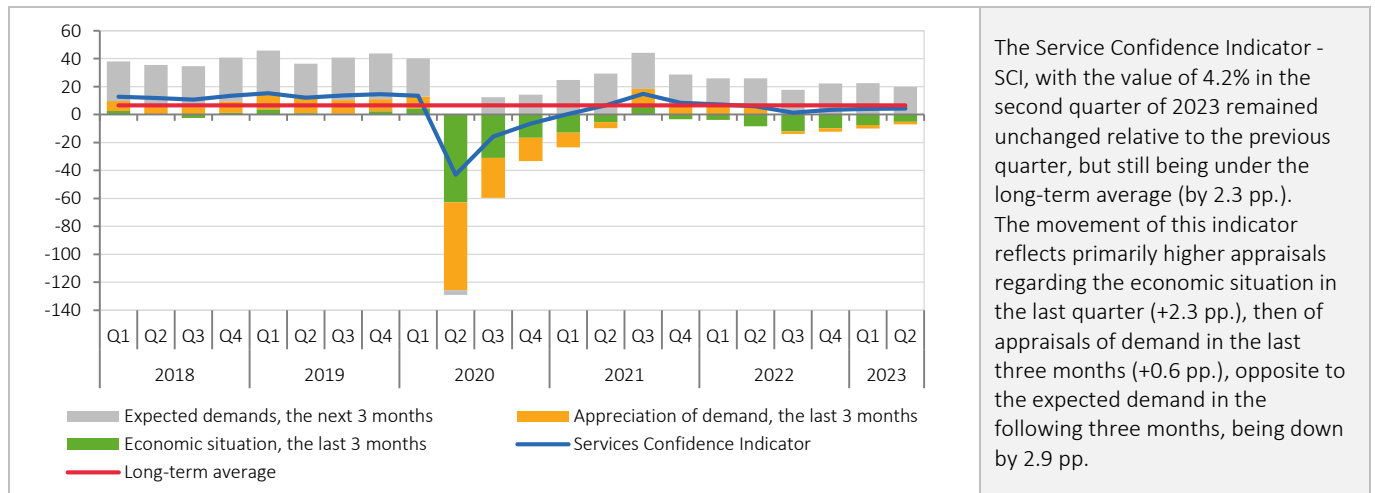
Chart 11.3. Industry Confidence Indicator (%) (seasonally adjusted data)



11.3. SERVICE CONFIDENCE INDICATOR

The survey in services is made of questions about the economic situation, current and expected demand for services.

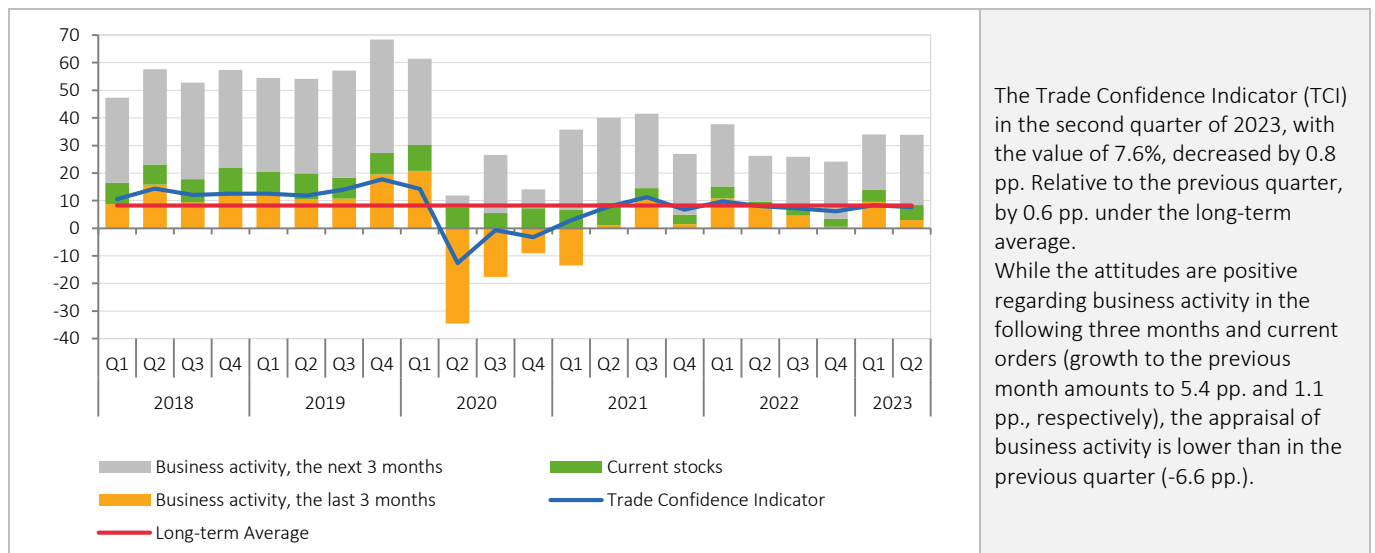
Chart 11.4. Service Confidence Indicator (%) (seasonally adjusted data)



11.4. TRADE CONFIDENCE INDICATOR

The survey in retail trade is made of questions about the current and future business activity of enterprises and stock balance.

Chart 11.5. Trade Confidence Indicator (%) (seasonally adjusted data)



11.5. CONSTRUCTION CONFIDENCE INDICATOR

The survey in construction is made of questions about contracted orders and expected employment.

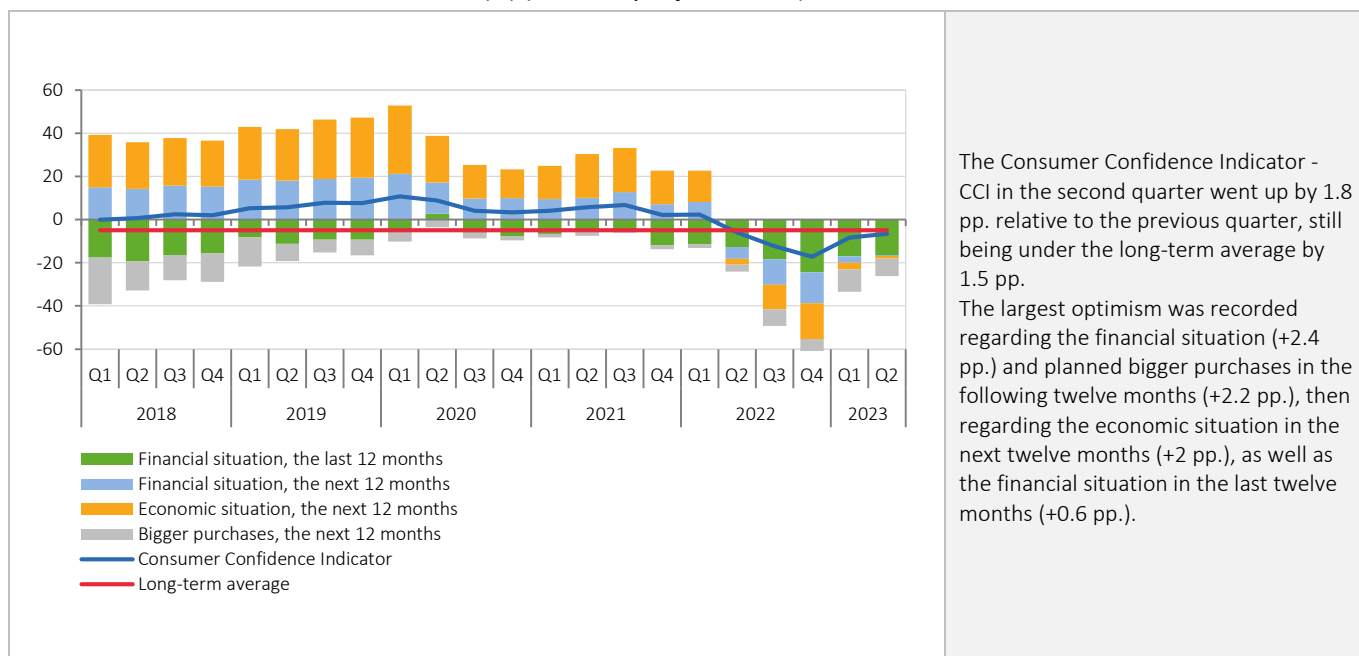
Chart 11.6. Construction Confidence Indicator (%) (seasonally adjusted data)



11.6. CONSUMER CONFIDENCE INDICATOR²⁷

The survey of household consumption is made of questions about household financial situation, general economic situation and expectations relative to bigger purchases.

Chart 11.7. Consumer Confidence Indicator (%) (seasonally adjusted data)

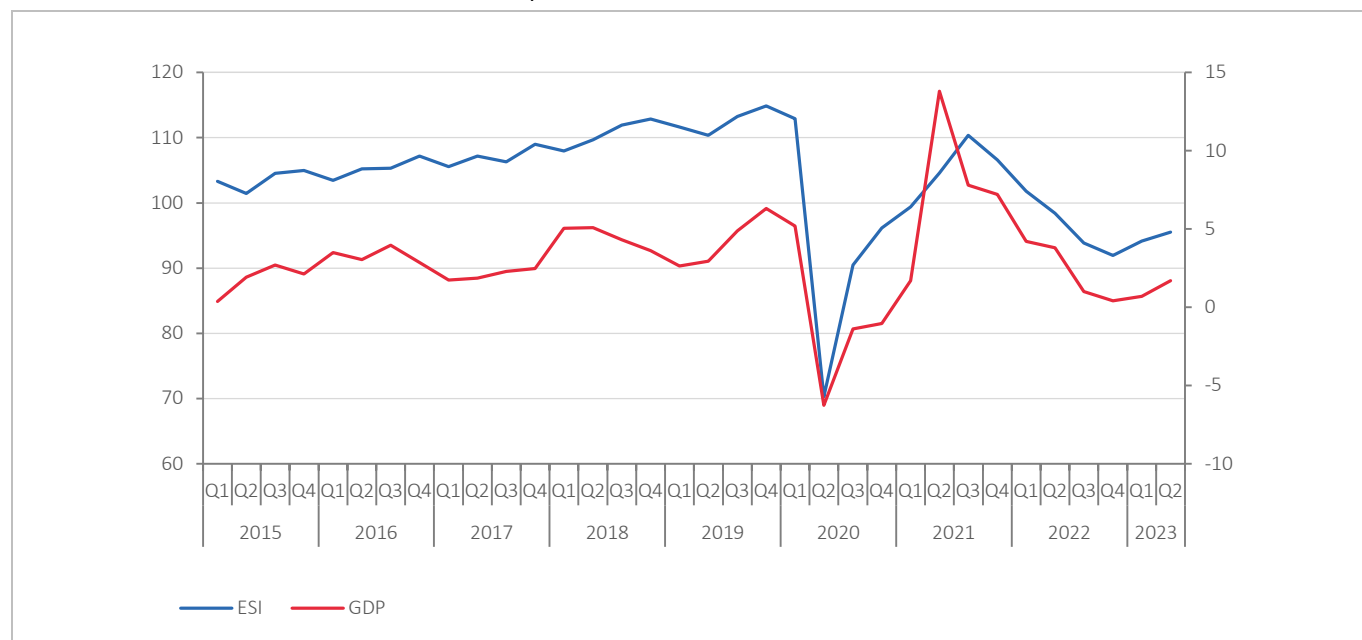


²⁷ The European Commission made changes in 2018 to the methodology for the calculation of the Consumer Confidence Indicator, therefore the data have been revised accordingly.

11.7. CORRELATION OF ESI AND GDP OF THE REPUBLIC OF SERBIA

Researchers and decision-makers in economic matters often include ESI as an explanatory variable with relevant pieces of information to model the economic growth, particularly if one takes into account that the data on the economic climate are available before most of the economic indicators. Gross Domestic Product (GDP) is the reference (explanatory) series that is most frequently used, because it reflects the movements in the economy as a whole. When considering that ESI represents a coincident indicator (showing changes at the same time when the changes are shown by the reference series), it can be concluded that it follows relatively well the GDP trend, which is confirmed also by the correlation coefficient of 0.68.

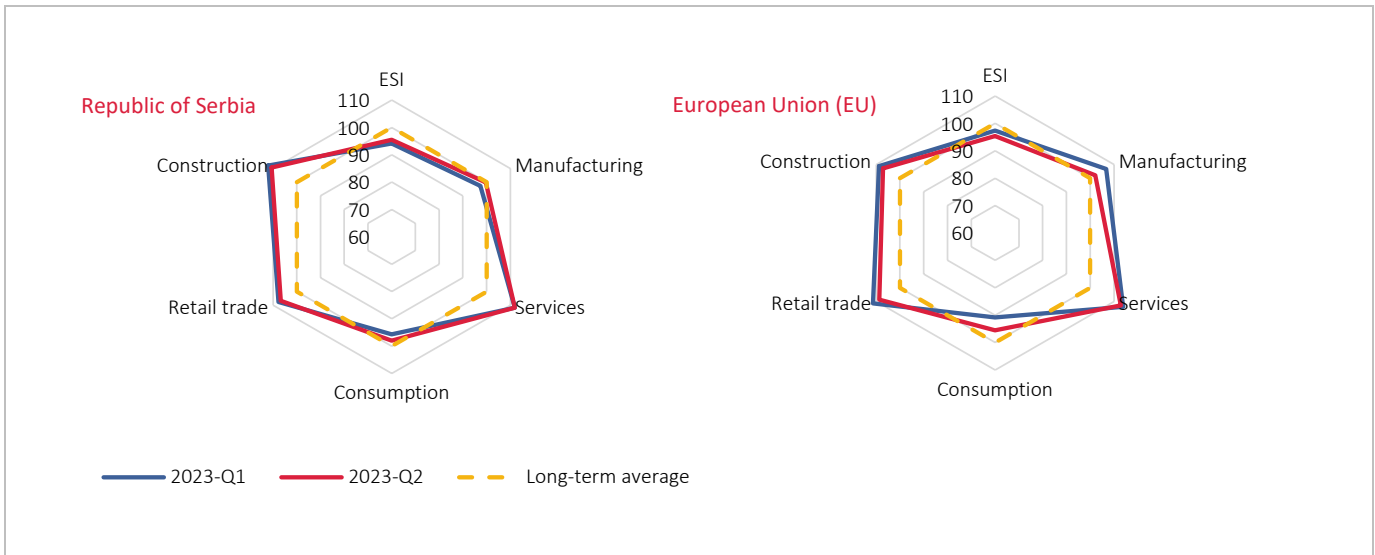
Chart 11.8. Correlation of ESI and GDP of the Republic of Serbia



11.8. ECONOMIC SENTIMENT INDICATOR IN THE EUROPEAN UNION

The economic climate in most of EU member states declined in the second quarter of 2023 (relative to the previous quarter), which made ESI go down (from the value of 95.3) by 2.1 p.p. The largest fall in expectations in the EU expectations was recorded in Manufacturing (-4.6 pp.), then in Retail trade (+2.6 pp.).

Chart 11.9. Economic Sentiment Indicators



HOW TO INTERPRETE THE TRACER?

The tracer scale of the chart ranges from 60 to 110 (average = 100). The most recent quarterly outcomes (Q2 2023) are compared with the previous quarterly outcomes (Q1 2023) and long-term average (= 100) of the corresponding series of confidence indicators. Developments far from the center reflect confidence indicator improvement, and close to the centre its decline.

12. REGIONAL ECONOMIC ASYMMETRIES

The starting point in realizing various aspects of regional asymmetries is the status of cities and municipalities of Serbia according to Regulation on establishing *List of Regional Development and Local Government Units for 2014* (Official Gazette of RS, no 104/2014). In compliance with the Regulation, excluding Beogradski region that comprises no municipality with the status of undeveloped area, in other three regions, number and size of undeveloped municipalities extremely varies – Region Vojvodina has only one municipality in the group of extremely underdeveloped (out of 46 municipalities), Region Southern and Eastern Serbia has even 30 (out of total of 53), and in Region Sumadija and Western Serbia, such status is recorded in 13, out of 53 municipalities. On the other hand, there is no municipality in Region Vojvodina with the status of devastated municipality (devastated means that development level is below 50% of the Republic average – see Glossary), while in Region Sumadija and Western Serbia, the mentioned status is recorded in three municipalities, and in Region Southern and Eastern Serbia, even 16 municipalities.

Unequal economic development in Serbia in the last several decades has contributed to deeper, already existing territorial inequalities. Regional polarization is apparent at several levels – undeveloped area, developed centre and insufficiently developed periphery. Regional disproportions – expressed in economic, social, demographic and infrastructure indicators – reflect characteristics of economic and social system of the country.

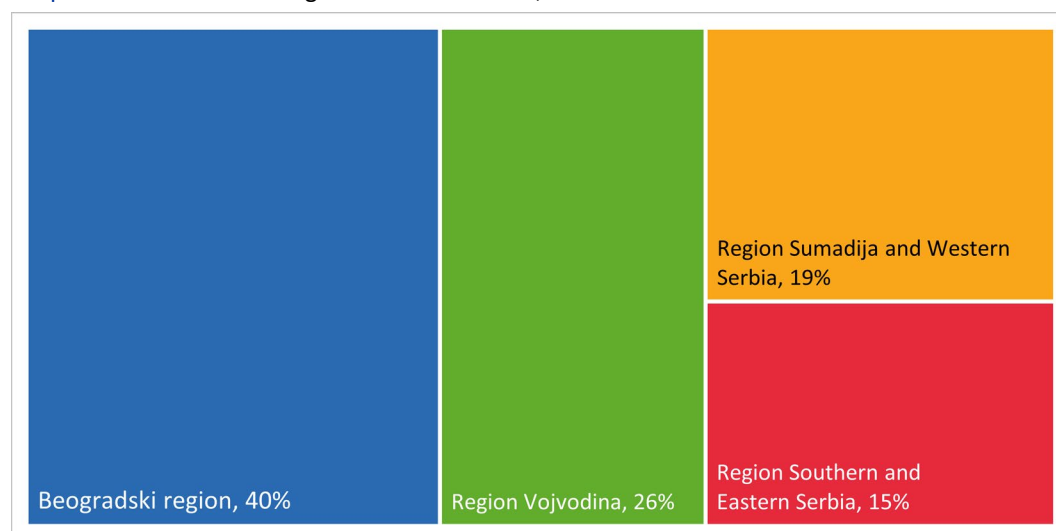
■ Gross domestic product

Regional gross domestic product presents primary statistical indicator for estimating economic performances of the region and effectiveness of regional policies and programs directed to decreasing the gap among the regions.

Out of total GDP in 2021, observed by level of NSTU 2 regions, the greatest realized GDP was in Beogradski region (40.2%), followed by Region Vojvodina (25.6%), Region Sumadija and Western Serbia (18.3%) and Region Southern and Eastern Serbia (14%).

Knowing that Beogradski region covers 3.7% of the area inhabited by 24% of the population of Serbia, it is clear that it is also the region with the highest GDP per capita (1 492 000 RSD / per capita, i.e. 62.6 % above the republic average or almost two times higher than in Region Southern and Eastern Serbia). Other regions record GDP per capita under the average, i.e. Region Vojvodina -3.5%, Region Sumadija and Western Serbia -31.6% and Region Southern and Eastern Serbia -27.9%.

Graph 12.1. Share of the regions in national GDP, 2021



■ Average salaries and wages

Level of regions' development, measured by average net salaries and wages varies in ratio 1.5:1, i.e. the highest salaries and wages are recorded in Beogradski region, and lowest ones in Region Sumadija and Western Serbia. Average net salaries and wages in the period January - June 2023 in Beogradski region amounted to RSD 106 746, or 127% of RS average (RSD 84 204), in Region Vojvodina, they were insignificantly below RS average (RSD 79 690, or 95% of RS average), while in Region Southern and Eastern Serbia and Region Sumadija and Western Serbia, they were about 86% and 83% of the Republic average (RSD 72 399 and RSD 70 165, respectively). In all regions, average salaries and wages recorded growth relative to the same quarter of the previous year, and the greatest relative increase was noted in Beogradski region, by 16.3%.

In 78 municipalities, average net salaries and wages were below 80% of the Republic average, i.e. in particular Belgrade municipalities, average salaries and wages were more than double relative to municipality of Presevo (with the lowest average salaries and wages of RSD 56 753). Moreover, at the bottom of the list are the municipalities of Bojnik with an average salary of RSD 56 994, Blace (58 311 and Vlasotince (58 542).

■ Labour market

The correlation of unemployment rate and development level of the region is very high, and in accordance with the mentioned, Region Southern and Eastern Serbia, with unemployment rate of 14.4% in the period January-June 2023, by 41.5% exceeds the average of Serbia (10.1%). On the other hand, in Beogradski Region, unemployment rate was the lowest, 7.7%, i.e. 24.6% below the national average. Additionally, referring to employment rate, it is the highest in Beogradski region (55.2% or 10.7% above the average of Serbia), while in Region Southern and Eastern Serbia, noted was the lowest employment rate of 44%, or 11.7% below the Republic average (49.8%).

In the period January-June 2023, Beogradski Region recorded the largest share in total employment (27.6%), with the simultaneously lowest share in unemployment (20.9%). On the other hand, Region Southern and Eastern Serbia with 19% has the lowest share in total employment in Serbia, participating with 28.9% in total unemployment in Serbia (according to the Labour Force Survey).

■ Export activity

In contrast to other indicators, in the period January-June 2023, Beogradski region was not on the first place regarding total export of Serbia (share of 24.4%). Region Vojvodina is on the first place with the share of 32.8% in export, followed by Region Sumadija and Western Serbia (20.7%) and Region Southern and Eastern Serbia (19.3%). Export per capita reflects regional asymmetries – Region Vojvodina records the export of EUR 2 748 per capita, and it is by 25% above the Republic average and it almost double exceeds the export value per capita in Region Sumadija and Western Serbia (EUR 1 657), which is by 25% below the average of the Republic. Region Vojvodina, as the leading exporter in the second quarter of 2023, recorded the greatest share in export²⁸ and the greatest share of agricultural and food products (18.1%), primarily cereals (21.9%), the most important export product being maize (8% of export of agricultural and food products).

■ Demographic structure

According to the last available data for 2022, population density in Beogradski region is by 6.9 times greater than average population density in Serbia, while in Region Southern and Eastern Serbia, population density was the lowest – 29% below the Republic average. Although all regions participate relatively equally in total population of Serbia, interregional differences are particularly apparent. For example, in eight towns in Region Vojvodina, lives even over a half of total population of Vojvodina (54.7%). However, the most obvious population inequality is in other two regions: Region Sumadija and Western Serbia comprises 10 towns in which 55% of total population of the Region lives, while in 13 undeveloped municipalities, only 13 % of population lives. This ratio is even more noticeable in Region Southern and Eastern Serbia, as 56% of population lives in 9 cities, while even in 30 underdeveloped municipalities live 31% of population. Additionally, due to economic migrations, number of population in Beogradski region is constantly increasing (by 1.3% between 2011 and 2022), while the number of population in other three regions is constantly decreasing. Simultaneously, it means that differences in population density will be even greater as population in Region Southern and Eastern Serbia is becoming more and more fragmented, while population density in Beogradski region becomes increasingly denser.

²⁸ According to the Standardized International Trade Classification (SITC).

■ Transport infrastructure

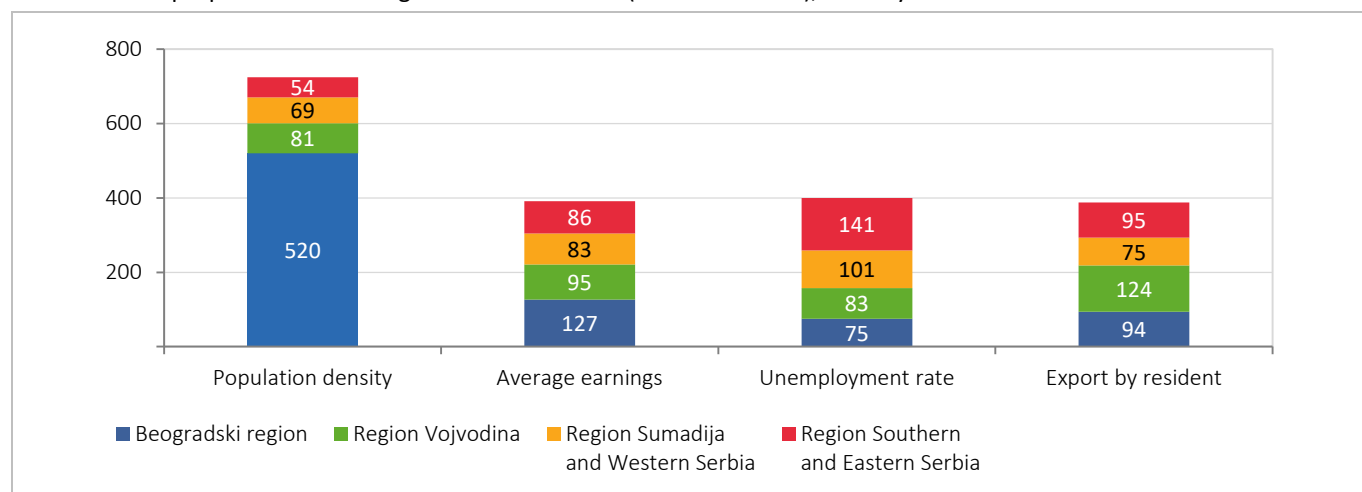
In the Republic of Serbia, there are huge regional and interregional differences regarding infrastructure equipment (transport, telecommunication and water management, i.e., accompanying supra structures). In roads' quality, telecommunication and modern living conditions, differences are, first of all, manifested in underdeveloped south area and more developed north area of Serbia. The unsatisfactory condition of the road network is particularly evident in the municipal (local) roads, necessary for the daily functioning, development and activation of municipalities and settlements. This is clearly indicated by the fact that 40 municipalities²⁹ have an out-of-band participation of local roads with a modern roadway, while four municipalities account for less than 20%, which are actually undeveloped and devastated areas facing the biggest developmental problems. Also, *the car renewal rate* (the number of cars registered for the first time in relation to the total number of registered cars) as an indicator of socio-economic inequalities at the regional level varies in 2022 from 5.7 in Region Southern and Eastern Serbia to 7.8 in Beogradski region, where a quarter of the vehicles was registered. The number of first-time registered cars compared to the number of inhabitants over January-June 2023 reflects a similar ratio, with Beogradski region leading up to 41% above the average of the Republic of Serbia versus Region Southern and Eastern Serbia, with 29% below the national average.

Regional asymmetry is seen through the relation between the extreme (the highest and the lowest) values of the key indicators. For example, the highest density of population is recorded in Belgrade and exceeds 9 times the population density in Region Southern and Eastern Serbia, where it is the lowest (Table 12.1)

Table 12.1 Extreme values and indicators of regional asymmetry, January-June 2023

Indicators	Population density, km ² , 2022	GDP/per capita, 2021	Average net salaries and wages	Unemployment rate	Export per capita	Demographic emptying, 2011–2022 (%)
	9,7 : 1	2,3 : 1	1,5 : 1	1,9 : 1	1,6 : 1	(-10,5) : (+1,3)
Extreme Values (the highest : the lowest)	Beogradski region: Region Southern and Eastern Serbia	Beogradski region: Region Southern and Eastern Serbia	Beogradski region: Region Sumadija and Western Serbia	Region Southern and Eastern Serbia: Beogradski region	Region Vojvodina: Region Sumadija and Western Serbia	Region Southern and Eastern Serbia: Beogradski region

Chart 12.2. Disproportions at the regional level in Serbia (RS level = 100%), January-June 2023



²⁹ The data is for 2021.

Table 12.2. Indicators of regional development of Serbia (NSTJ 2) (RS level = 100%)

	2021 ³⁰				2022 ³¹				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Beogradski region										
Average salaries and wages in dinars	124.0	123.8	124.6	126.2	125.8	125.8	126.3	128.0	126.6	127.0
Employment rate	109.5	109.1	107.2	106.2	107.6	108.2	110.6	110.2	110.7	109.9
Unemployment rate	75.0	81.1	83.8	81.6	75.2	83.1	82.2	83.0	75.2	80.2
Exports per capita in euros	93.2	94.2	97.4	96.4	88.9	89.1	92.0	98.2	93.9	99.3
Number of first- time registered passengers' cars per 1000 inhabitants	125.0	136.8	124.3	125.4	123.4	132.6	129.5	131.9	133.8	146.4
Region Vojvodina										
Average salaries and wages in dinars	95.2	94.8	94.5	95.1	95.1	94.9	94.9	95.4	95.1	94.2
Employment rate	101.9	99.2	101.6	102.8	98.8	99.4	100.6	99.2	99.8	102.2
Unemployment rate	85.2	86.5	83.8	89.8	89.9	85.4	76.7	83.0	87.1	82.3
Exports per capita in euros	136.8	131.8	125.6	123.1	128.2	131.4	127.9	125.5	124.4	126.0
Number of first- time registered passengers' cars per 1000 inhabitants	94.4	89.7	90.2	94.1	97.2	92.3	90.4	93.4	95.1	88.5
Region Sumadija and Western Serbia										
Average salaries and wages in dinars	84.9	85.2	85.2	84.2	83.9	83.9	83.9	83.0	83.2	83.4
Employment rate	98.9	100.0	101.0	100.4	101.2	98.8	97.2	101.0	99.4	98.8
Unemployment rate	114.8	122.5	110.5	109.2	112.8	122.5	116.7	110.6	101.0	106.3
Exports per capita in euros	79.6	80.4	79.0	76.9	76.7	77.2	76.8	76.8	74.6	76.5
Number of first- time registered passengers' cars per 1000 inhabitants	98.9	94.5	101.0	99.7	96.7	94.2	100.0	97.7	95.0	90.8
Region Southern and Eastern Serbia										
Average salaries and wages in dinars	87.8	88.3	87.9	85.7	86.6	86.9	86.1	83.9	85.9	86.1
Employment rate	88.3	90.3	88.2	88.4	89.5	93.2	90.2	89.6	88.5	87.3
Unemployment rate	131.3	109.0	127.6	124.5	126.6	109.0	132.2	130.9	147.5	143.8
Exports per capita in euros	82.6	88.0	93.1	98.4	101.4	95.4	90.8	89.7	94.7	87.4
Number of first- time registered passengers' cars per 1000 inhabitants	78.2	76.0	81.7	77.6	79.0	77.1	76.0	72.7	72.1	70.6

³⁰ Labour market indicators - employment rate and unemployment rate, were created according to the new redesigned Eurostat methodology, which the Statistical Office of the Republic of Serbia has been conducting as a part of 2021 Labour Force Survey. The change in methodology was made on the basis of and in accordance with the new Regulation of the European Parliament and the Council, which entered into force on January 1 st, 2021. More information on methodological changes and their effects on the main statistical indicators can be found in a special publication via the link: <https://www.stat.gov.rs/vesti/20210628-anketa-o-radnoj-snazi-nova-metodologija/>

³¹ Data on employment and unemployment rates for 2022 have been revised. and are not comparable with data from previous years. Estimates for the first and second quarters of 2023 were calculated based on demographic estimates for 2022, according to 2022 Census of Population, Households and Dwellings. Demographic estimates based on 2011 Census were used to calculate the grades as of the fourth quarter of 2022. In order to ensure the comparability of the data from the first quarter of 2023 with the data from 2022, LFS data was revised based on the revision of the demographic estimates according to 2022 Census. In the following months, based on the revised population estimate data for the inter-census period, the revision of the LFS data for the relevant period before 2022 will be carried out. The post-census audit is carried out in accordance with the General Audit Policy of the Statistical Office of the Republic of Serbia, which is fully aligned with the guidelines from the Manual on Revision Policy in the European Statistical System (ESS Guidelines on Revision Policy), which was adopted by the Committee of the European Statistical System (European Statistical System Committee). The aim of the post-census revision of ARS data is to ensure comparability without breaking the time series.



GLOSSARY

Classification of regions and local government units (municipalities) – according to the Regulation. The Regulation establishes the unique list of *regions'* development (that are by development levels classified as developed and insufficiently developed regions) and *municipalities*, classified in four groups and devastated areas. In the first group are municipalities with the development level above the Republic average; in the second group are municipalities with the development level of 80% - 100% of the Republic average, the third group comprises insufficiently developed municipalities with the level of development of 60% - 80% of the average, while in the fourth group are extremely insufficiently developed municipalities, with the development level below 60% of the Republic average.

Devastated areas are municipalities from the fourth group with the development level below 50% of the Republic average (according to the data of the authority competent for statistics and finances tasks). Classification of the regions is performed on the basis of GDP value per capita in the observed region compared to Republic average, for the referent period. Developed regions are the regions that realize gross domestic product value above the Republic average, (Beogradski Region and Region Vojvodina). Insufficiently developed regions are the ones in which GDP value is below the Republic average, (Region Sumadija and Western Serbia and Region Southern and Eastern Serbia). Additionally, status of insufficiently developed region refers to Region Kosovo I Metohija.

Demographic emptying is the term that depicts natural and mechanical population outflow in the specific geographic and administrative area.

13. AGRICULTURE

Agricultural production is made of two main branches: plant production and livestock production. Due to its specific nature, relevant data related to agricultural production are available mainly on annual basis. This issue of Trend presents the movement of occurrences in agriculture concerning:

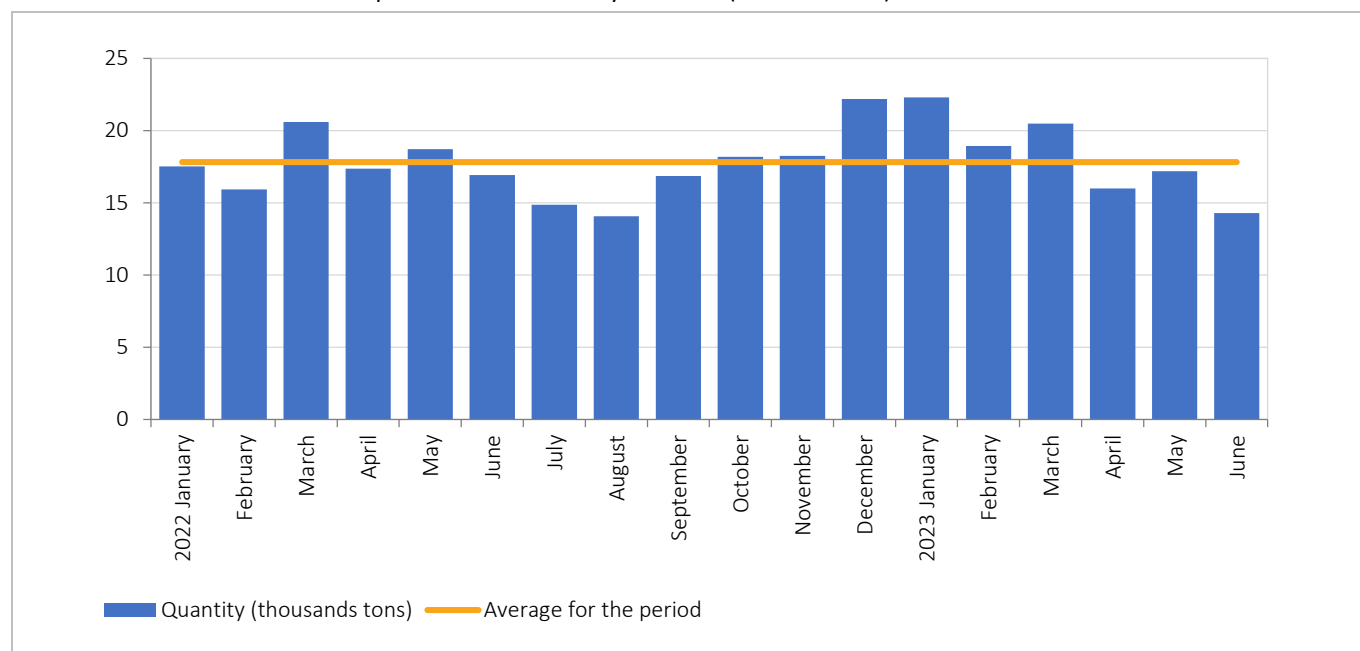
- occurrences in livestock production (production of consumption cow milk in dairy factories and livestock slaughtering in slaughtering houses),
- prices of agricultural products and intermediate goods,
- external trade in agricultural products, and
- expected yield of wheat, maize and sunflower.

13.1. PRODUCTION AND PRICES OF MILK, CEREALS AND LIVESTOCK

Estimates show that agricultural holdings dealing with the production of cow milk distribute to milk collection stations (dairy factories) about 59% of the total production³². Of the quantity of milk that stays on the holding (about 41%) about 10% is consumed for feeding household members and livestock on the holding, about 22% are processed into dairy products (mainly cheese and „kajmak“), and the remaining part (about 9%) is sold to direct consumers. According to the same source, losses on the holding are insignificant (up to 0.1%)

Cow milk accounts for 97% of the total production of milk on holdings, and the remaining milk is of sheep and goats. In the period January-June 2023, the production of consumption cow milk in dairy factories is higher by 2% than that in the same period of the previous year. Observed quarterly, in the second quarter of 2023 the production of cow milk saw a fall of 10.4%, compared with the second quarter of 2022.

Chart 13.1. Production of consumption cow milk in dairy factories (in thous. tons)



³² Survey on Agricultural Production – Livestock Production, 2022

Purchase prices of cow milk increased by 50.5% over January-June of the current year relative to the same period of the previous year³³. When compared with the average milk price, the prices in the first half of the current year increased by 22.6%.

Consumer prices of cow milk increased by 72.5% over January-June of the current year relative to the same period of the previous year. When compared with the average price of milk of the previous year, in the first six months of the current year milk prices increased by 51.2%.

Based on the comparative review and previous analysis, it can be concluded that the purchase prices of cow milk had a tendency of slight fall in the first half of the current year, while consumer prices in the first six months of the current year were stable.

As this issue of *Trends* does not analyse only livestock products but also certain crops from the plant production, as well as selected categories of livestock, it is necessary to present also their purchase prices.

Over January-June the **index of cereal prices** amounted to 93.1%. In this period, purchase prices of wheat decreased by 11.3% and maize by 11.9% relative to the same period of the previous year. In the first six months of the current year the prices of **industrial plants** saw a fall of 3.4% relative to the same period of the previous year.

Observed **by categories of livestock**, over January-June of the current year the purchase price of bovine animals increased by 8.4% and of pigs by 25.9%, compared with the same period of the previous year.

Table 13.1. Comparative review of purchase and consumer prices of cow milk

Month	Milk price, din./l.	
	Purchase price	Consumer price
January 2022	36.91	95.33
February	37.54	95.50
March	38.08	96.81
April	39.86	97.41
May	40.97	101.62
June	42.29	104.46
July	45.16	110.10
August	47.70	111.30
September	53.13	117.40
October	63.87	133.60
November	65.88	141.80
December	67.06	143.40
January 2023	65.04	170.25
February	63.05	169.92
March	60.53	170.40
April	57.65	169.70
May	54.80	169.80
June	53.49	169.90

Table 13.2. Indices of producers' prices of agricultural and fishing products

	<u>VI 2023</u> V 2023	<u>I-VI 2023</u> I-VI 2022	<u>I-VI 2023</u> Ø 2022
Cereals	89.6	93.1	89.4
Wheat	92.9	88.7	84.7
Maize	92.4	88.1	84.1
Industrial plants	97.7	96.6	94.3
Livestock and poultry	93.8	118.0	108.7
Bovine animals	100.1	108.4	104.6
Pigs	91.6	125.9	112.0

³³ Those are producers' prices of agricultural and fishing products – prices at which purchase is done from family holdings and prices at which legal persons in the field of agriculture sell their products.

13.2. INTERMEDIATE GOODS

A stable and successful production in agriculture depends on many factors. As far as plant production is concerned, besides adequate land tillage for high and stable yields, the used inputs are extremely important. The latter refer to seeds and seeding materials, fertilizers and protection preparations. As for the other agricultural branch, i.e. livestock production, good animal health and increase require adequate animal feed and housing facilities. To meet all these conditions one need not only human labour but also capital goods, i.e. agricultural machinery. Therefore, farmers have to have corresponding machinery or to engage others (fertilization, sprinkling, harvest, etc.). All these factors make the intermediate consumption (accounting for almost 60% of the total value of agricultural production) and their price indices are shown in table 13.3.

The total intermediate consumption, i.e. the prices of intermediate goods, capital goods and services in agriculture in the second quarter of 2023 increased by 0.2% compared with the same quarter of the previous year. Observed by groups of products, the largest price increase in the second quarter of 2023, relative to the same quarter of the previous year, was recorded in: Seeds (34.9%) and Facility maintenance (17.1%).

The prices of intermediate goods, capital goods and services in agriculture in the second quarter of 2023 relative to the first quarter of 2023 increased, on average, by 3.5%.

Table 13.3. Indices of the prices of material goods, capital goods and services in agriculture

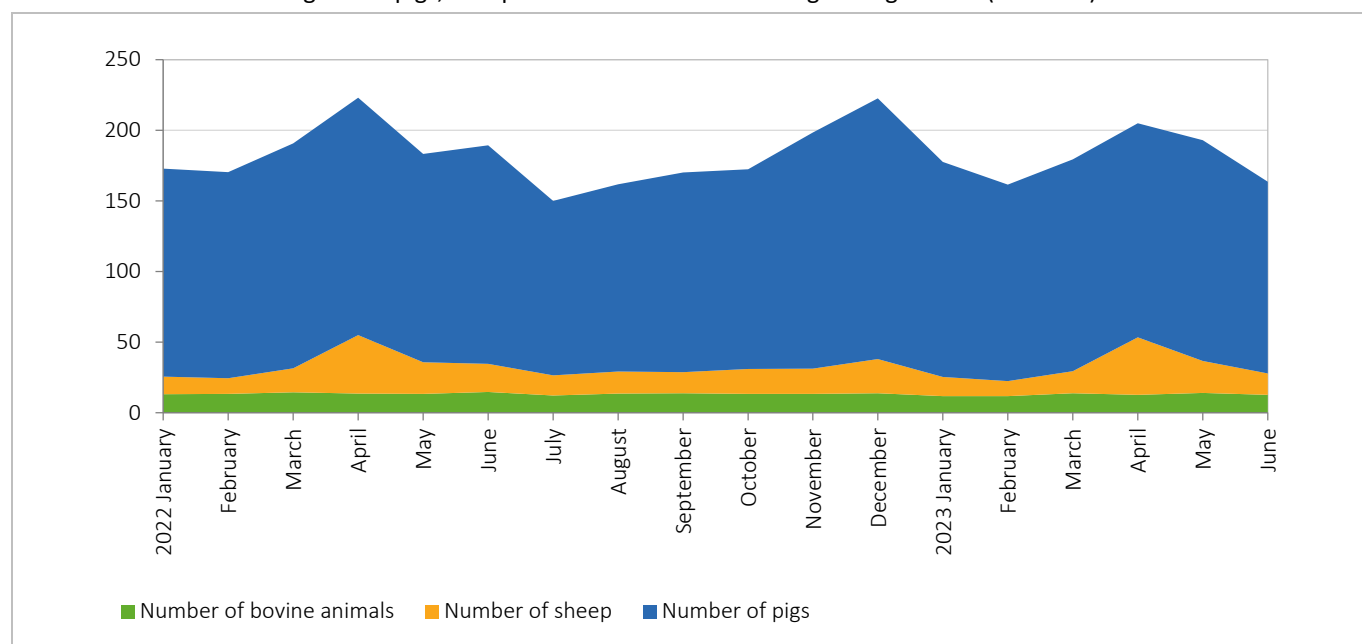
	<u>Quarter II 2023</u> Quarter II 2022	<u>Quarter II 2023</u> Quarter I 2023	<u>II 2023</u> Ø 2023
Total	100.2	96.5	101.9
Products and services for current use in agriculture	100.0	96.1	101.8
Seed	134.9	97.1	134.0
Energy commodities	107.6	102.0	106.3
Mineral fertilizers	69.9	80.9	76.9
Plant protection preparations	100.8	98.4	103.3
Animal feed	92.2	93.7	93.8
Equipment maintenance	108.8	101.3	107.4
Facilities maintenance	117.1	103.2	116.8
Other products and services	115.3	104.4	115.4
Products and services for investments in agriculture	103.2	100.8	103.5
Machinery in agriculture	103.2	100.8	103.5

13.3. LIVESTOCK SLAUGHTER

In the Republic of Serbia, livestock slaughter is performed in registered slaughtering houses and outside them, i.e. on agricultural holdings. As far as bovine animals are concerned, slaughter in slaughtering houses accounted for about 57% of total slaughter of this livestock species, while with pigs and sheep slaughter is mostly done outside slaughtering houses, about 60% and 83%, respectively. Data on livestock slaughter in slaughtering houses on the territory of the Republic of Serbia, totaling on 30 June 2023 to 350. In this issue of Trends, the analysis is focused on livestock slaughter in slaughtering houses.

In the first half of 2023, relative to the same period of the previous year, the total number of bovine animals slaughtered in slaughtering houses amounted to 7.4% thousand. Observed by quarters, in the first quarter the number of bovine animals slaughtered in slaughtering houses fell by 9.5%, and in the second quarter of 2023 by about 5.3%, compared with the same quarter of the previous year. The category of slaughtered bovine animals, which recorded the largest fall is that of bovine animals up to one year of age (fall of 32% relative to the same quarter of the previous year). The largest share in total slaughter in the second quarter of this year was that of bovine animals aged 1–2, amounting to 79.8%.

Chart 13.2. Number of slaughtered pigs, sheep and bovine animals in slaughtering houses (in thous.)



The number of pigs slaughtered in slaughtering houses in the first six months of 2023 was lower by 4.1% than in the same period of the previous year. Observed quarterly, in both quarters the number of pigs slaughtered in slaughtering houses was lower than in the same period of the previous year: in the first by 2.4%, and in the second by 5.6%. The category of slaughtered pigs, which in the second quarter of the current year noted the largest fall was that of piglets up to 25 kg (fall of 29.1% relative to the same quarter of the previous year). Of totally slaughtered pigs in slaughtering houses the largest share in total slaughter of this livestock species was that of pigs up to 50 kg, 90.5%.

Of the total number of slaughtered sheep on the territory of the Republic of Serbia only about 17% were slaughtered in slaughtering houses. In the second quarter of 2023, the number of sheep slaughtered in slaughtering houses was 78.4 thousand, by 6.5% less than in the same quarter of the previous year. Of totally slaughtered sheep in slaughtering houses the largest share (97.4%) in the total slaughter of this species of livestock was that of lambs up to six months.

13.4. EXTERNAL TRADE IN AGRICULTURAL PRODUCTS

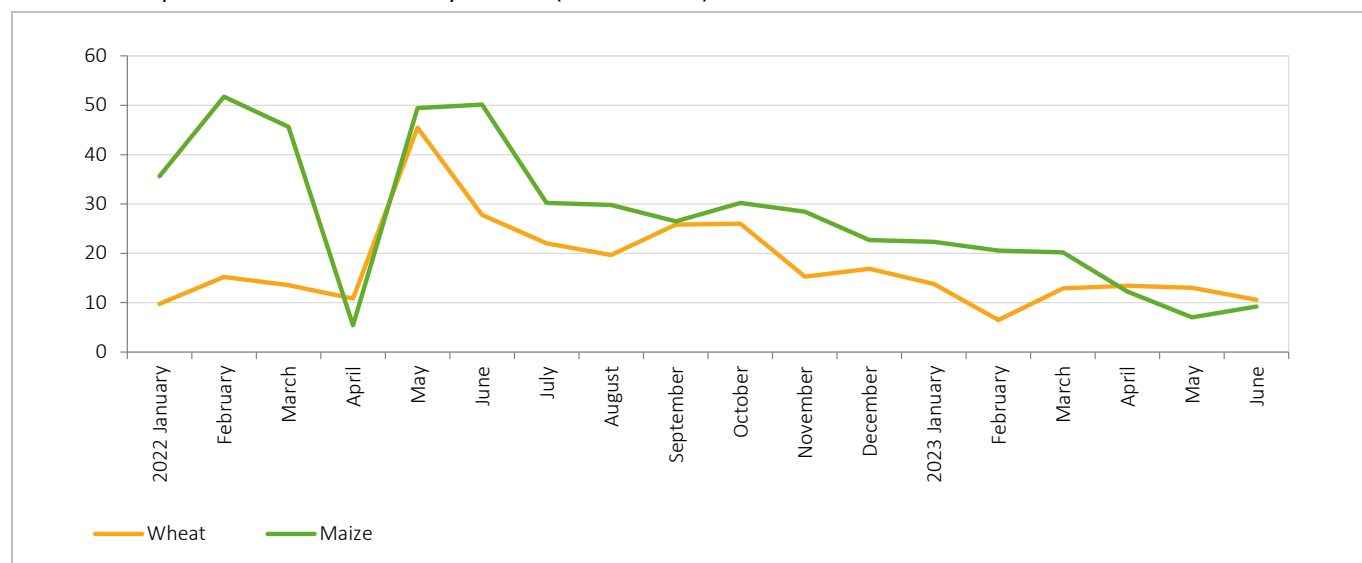
In the first six months of 2023, the section Agriculture, forestry and fishing³⁴ realised a negative external trade balance of EUR -122.5 million. Exports of this section amounted to about EUR 418.8 million, by 36.2% less than in the same period of 2022, and the share in total exports in the observed period fell from 4.9% to 2.9%, amount reached in the first half of the current year. Imports of this section in the first six months of the current year amounted to EUR 541.2 million, by 17.8% more than in the same period of the previous year, and the share in total imports grew from 2.3% to 2.9%.

Exports fall in the first six months of the current year is mostly a result of a cumulative fall of 47.3% in exports of wheat (except for rice), leguminous and oil seed, the most representative groups in this section (share of 52.7%). In contrast to exports, the most representative groups of products on import side in the section of Agriculture, forestry and fishing was Growing vegetables, root and tuber vegetables (share of 22.9%), which generated a cumulative growth of 25.2% in the first six months of the current year.

Export of maize over January-June of the current year amounted to EUR 91.5 million, a fall of 61.5% relative to the same period of the previous year. Most of maize, when looking at the value, was exported to Bosnia and Herzegovina (30.7% of total exports of this crop). 9.8% were exported to Italy, then to Romania, Albania and North Macedonia, accounting respectively for 8.6%, 6.5% and 5.2% of total export of this crop.

Export of wheat in the first six months of 2023 amounted to EUR 70.1 million, a fall of 42.8% relative to the same period of the previous year. Looking at values, in the first half of the current year most of the wheat was exported to Italy (44.3% of total exports of wheat), then to Romania (21.6%) followed by Bosnia and Herzegovina, North Macedonia and Albania with 12.3%, 9.1% and 7.3%, respectively.

Chart 13.3. Export of wheat and maize by months (in mill. euros)



³⁴ According to CA (2010).

13.5. EXPECTED PRODUCTION OF WHEAT, MAIZE AND SUNFLOWER

Two most important crops of plant production in our country - wheat and maize were grown in 2022 on an area of about 631 thousand hectares (wheat) and of about 952 thousand hectares (maize). The estimates in 2023 indicate that areas under wheat increased by about 8%, while those under maize decreased by about 1.5%. Sunflower is along with maize one of the most significant summer crops in our country, which in 2022 was grown on an area of 251 thousand hectares, while in the current year the estimates show that the areas under this crop decreased by about 4%.

The very beginning of the year, i.e. first period when the first estimates of average yields in May were optimistic regarding the yields of winter wheat. However, the weather in June and July, marked by abrupt temperature changes, from precipitations to very high temperatures, influenced also the quality of grains, thus smaller estimated yield, but still larger than last year. On the other hand, the yield of maize and sunflower was relatively stable since the first estimates, and as with wheat average yields are expected to be larger than in the previous year.

According to the last results of agricultural counseling services (end of August of the current year), the total production of wheat is estimated to increase by about 10.1% and to amount to about 3.4 million tons, while the total production of maize will drastically go up (year-on-year growth of about 57%) and this year it amounts to about 6.7 million tons. The estimates show that the production of sunflower will increase by about 25% relative to the previous year and amount to about 757 thousand tons.

All the above makes us conclude that 2023 was, besides unstable weather in June and July, marked by big oscillations of temperature and violent storms, but with sufficient quantity of rainfall, very favourable for crops in our country. Also, based on the available data and estimates of the SORS and other institutions it is expected that all crops, both winter and summer ones, will experience higher yields and production in the current year in relation to the previous one.

Table 13.4. Realised average yields in the previous agricultural year and estimated yields of wheat, maize and sunflower in the current agricultural year (in tons per hectare)³⁵

Date	Crop					
	Wheat		Maize		Sunflower	
	2022	2023	2022	2023	2022	2023
29/06/2023	4.9	5.6	4.5	-	2.6	-
06/07/2023		5.4		7.4		3.3
13/07/2023		5.2		7.3		3.3
20/07/2023		5.2		7.3		3.2
27/07/2023		5.2		7.3		3.2
01/08/2023		5.1		7.2		3.3
08/08/2023		5.1		7.2		3.2
22/08/2023		5.1		7.3		3.2

³⁵ In Table 13.4 the columns referring to 2022 show the realised yield in the previous year, and columns for 2023 contain estimated yields by dates.

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