

STRUCTURAL ANALYSIS OF THE INDUSTRIAL PRODUCTION OF BELARUS IN THE CONTEXT OF INDUSTRIAL POLICY DEVELOPMENT

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The article is devoted to the study of structural changes in the industrial production of the Republic of Belarus in 2011–2014. The authors analysed a group of indicators characterizing the structure of industrial production: the share industrial sectors' output in gross output of the economy, the share of industrial sectors' value-added in the gross value added, the share of value added in gross output of the industrial sectors'. The study evaluates the effectiveness of structural changes which have occurred, and provides recommendations for developing industrial policy of the Republic of Belarus.

Key words: industrial production; industrial policy; structural analyses; structural shifts; value added; output.

СТРУКТУРНЫЙ АНАЛИЗ ПРОМЫШЛЕННОСТИ РЕСПУБЛИКИ БЕЛАРУСЬ В КОНТЕКСТЕ ФОРМИРОВАНИЯ И РЕАЛИЗАЦИИ ПРОМЫШЛЕННОЙ ПОЛИТИКИ

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Посвящена анализу структурных изменений в промышленном производстве Беларуси в 2011–2014 гг. Исследована группа показателей, характеризующих данную сферу: доля выпуска отраслей промышленности в общем объеме выпуска страны, доля добавленной стоимости отраслей промышленности в валовой добавленной стоимости, доля добавленной стоимости в валовом выпуске отрасли промышленности. Представлена оценка эффективности структурных изменений в промышленном производстве, а также даются рекомендации по совершенствованию промышленной политики Республики Беларусь.

Ключевые слова: промышленное производство; промышленная политика; структурный анализ; структурные сдвиги; добавленная стоимость; выпуск.

The industrial policy of the country can be defined as a set of activities of state regulation related to the acquisition of factors of production, organization of production, distribution and sales of goods and services in all phases of the life cycle of the entity and the life cycle of its products. As the industrial policy is sector-specific, the question of the choice of objects (sectors or individual enterprises) for state support tends to be one of the most important. Structural analyses of country's industry development can identify the priority sectors of its industry and helps to development mechanisms and tools for state support.

The structure of the industry of Belarus is traditionally represented by three main sectors: mining; manufacturing; electricity, gas and water supply (see figure). Manufacturing industry of the Republic of

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Belarus is represented by the following main sectors: food processing, machinery, automobile production, metal processing, chemical industry, timber processing, textile and footwear industry, petroleum products processing and others.

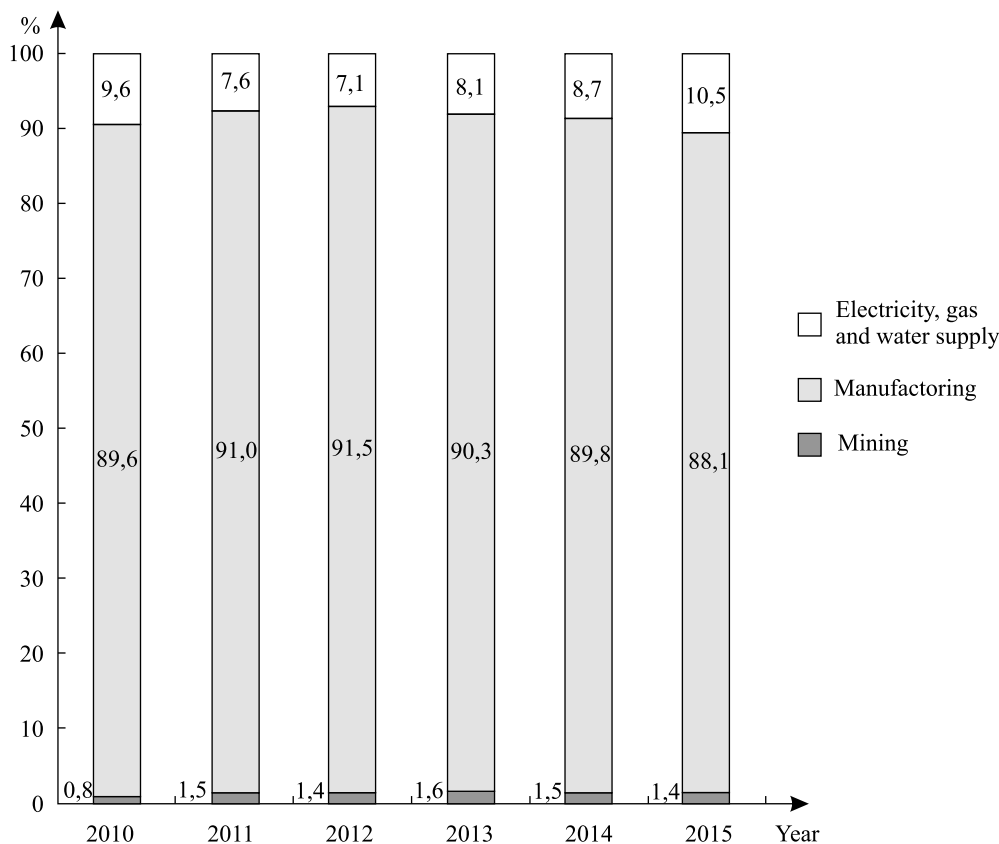


Fig. 1. The structure of the industry of the Republic of Belarus in 2010–2015, %
(source: author's development according to [1])

The biggest share in the structure of industrial production in Belarus belongs to manufacturing sectors, which account for almost 90 % of total industrial production. This figure is stable throughout the 2010–2014. But in 2015 was noticed a change in industrial production structure.

The change in the shares of sectors in total industrial production in 2015 led to the change in the structure of industrial production of the Republic of Belarus in comparison with 2011. Ranked structure of industrial production of the Republic of Belarus in 2011 and 2015 is shown in the table 1.

Table 1

Ranked structure of industrial production of the Republic of Belarus in 2011 and 2015

Rank	Year					
	2011			2015		
	Sector	Share in the total industrial production, %	Accumulated share in the total industrial production, %	Sector	Share in the total industrial production, %	Accumulated share in the total industrial production, %
1	Manufacture of coke, refined petroleum products and nuclear fuel	21,16	21,16	Manufacture of food products, beverages and tobacco	23,71	23,71
2	Manufacture of food products, beverages and tobacco	17,65	38,81	Manufacture of coke, refined petroleum products and nuclear fuel	16,34	40,05

Ending table 1

Rank	Year					
	2011			2015		
	Sector	Share in the total industrial production, %	Accumulated share in the total industrial production, %	Sector	Share in the total industrial production, %	Accumulated share in the total industrial production, %
3	Manufacture of chemicals and chemical products	11,48	50,29	Manufacture of chemicals and chemical products	11,39	51,44
4	Manufacture of machinery and equipment n.e.c.	7,88	58,17	Electricity, gas and water supply	10,54	61,98
5	Electricity, gas and water supply	7,57	65,74	Manufacture of machinery and equipment n.e.c.	6,65	68,63
6	Manufacture of fabricated metal products, except machinery and equipment	6,85	72,59	Manufacture of fabricated metal products, except machinery and equipment	6,15	74,78
7	Manufacture of motor vehicles, trailers and semi-trailers	5,46	78,05	Manufacture of other non-metallic mineral products	4,28	79,06
8	Manufacture of other non-metallic mineral products	4,23	82,28	Manufacture of electrical machinery and apparatus n.e.c	3,63	82,69
9	Manufacture of rubber and plastics products	3,61	85,89	Manufacture of rubber and plastics products	3,16	85,85
10	Manufacture of electrical machinery and apparatus n.e.c	3,53	89,42	Manufacture of motor vehicles, trailers and semi-trailers	3,06	88,91
11	Manufacture of textiles, wearing apparel, dressing and dyeing of fur	3,06	92,48	Manufacture of textiles, wearing apparel, dressing and dyeing of fur	2,82	91,73
12	Manufacture of paper and paper products. Publishing, printing	1,62	94,1	Manufacture of wood and of products of wood and cork	2,14	93,87
13	Mining	1,47	95,57	Manufacture of paper and paper products. Publishing, printing	1,6	95,47
14	Manufacture of wood and of products of wood and cork	1,32	96,89	Mining	1,36	96,83
15	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	0,82	97,71	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	0,71	97,54
16	Other industrial sectors	2,29	100	Other industrial sectors	2,48	100,

Note. Author's development.

Besides the change in the leadership structure of industrial production, the following changes in its structure should be noted:

- “manufacture of motor vehicles, trailers and semi-trailers” moved from the 7th rank in 2011 to 10th in 2015;
- a significant increase in the position in the structure of industrial production showed the following sectors: “manufacture of electrical machinery and apparatus n.e.c.” shifted from 10th place in 2011 to 8th in 2015; “manufacture of wood and of products of wood and cork” – from 14th rank in 2011 to 12th rank in 2015.

Analysing the list of industrial sectors which generate 80 % of gross industrial output, it should be mentioned that it is mostly constant, but in 2015 sector “manufacture of motor vehicles, trailers and semi-trailers” was replaced by “manufacture of other non-metallic mineral products”.

For further analyses and measurement of the effectiveness of structural changes occurred in 2011–2015 in the industry of Belarus, it is necessary to analyse extra indicators:

- shares of industrial sectors in the gross output of the Republic of Belarus,
- shares of the value added of industrial sectors in the gross value added,
- degree of added value in the industrial sector output.

Shares of industrial sectors in the gross output of the Republic of Belarus. Shares of industrial sectors in the gross output demonstrate the significance and importance of these sectors to the national economy. Shares of industrial sectors in the gross output of Belarus are shown in the table 2.

Table 2

Shares of industrial sectors output in the gross output of the Republic of Belarus in 2011 and 2014, %

Sector	Shares of industrial sectors output in the gross output		Change
	2011	2014	
Manufacture of food products, beverages and tobacco	9,14	10,54	1,40
Manufacture of textiles, wearing apparel, dressing and dyeing of fur	1,59	1,34	–0,24
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	0,43	0,35	–0,07
Manufacture of wood and products of wood and cork	0,68	0,87	0,19
Manufacture of paper and paper products. Publishing, printing	0,84	0,67	–0,17
Manufacture of coke, refined petroleum products and nuclear fuel	10,96	7,23	–3,73
Manufacture of chemicals and chemical products	5,95	4,39	–1,56
Manufacture of rubber and plastics products	1,87	1,54	–0,33
Manufacture of other non-metallic mineral products	2,19	2,47	0,28
Manufacture of fabricated metal products, except machinery and equipment	3,55	2,85	–0,70
Manufacture of machinery and equipment n.e.c.	4,08	3,36	–0,72
Manufacture of electrical machinery and apparatus n.e.c	1,83	1,56	–0,27
Manufacture of motor vehicles, trailers and semi-trailers	2,83	1,57	–1,25
Other sectors of manufacturing	1,18	1,17	–0,02
Electricity, gas and water supply	3,92	3,89	–0,03
Mining	0,76	0,65	–0,09

Note. Author’s development according to [1].

In 2014 the largest shares in Belarusian gross output belonged to the following industrial sectors: “manufacture of food products, beverages and tobacco”, “manufacture of coke, refined petroleum products and nuclear fuel”, “manufacture of chemicals and chemical products”, “electricity, gas and water supply”. Between 2011–2014 almost all sectors decreased their shares in the total output of the economy except “manufacture of food products, beverages and tobacco”, “manufacture of wood and products of wood and cork” and “manufacture of other non-metallic mineral products”.

The leaders in the decline of the sector's output shares in the gross output in absolute values are "manufacture of coke, refined petroleum products and nuclear fuel", "manufacture of chemicals and chemical products", "manufacture of motor vehicles, trailers and semi-trailers". Analysing rates of decrease of the sector's output shares in the gross output was found that the greatest changes were demonstrated by "manufacture of motor vehicles, trailers and semi-trailers" (–44,32 %), "manufacture of coke, refined petroleum products and nuclear fuel" (–34,05 %), "manufacture of chemicals and chemical products" (–26,21 %).

Shares of the value added generated by industrial sectors in the gross value added. The contribution of industrial sectors to the gross value added of the economy of Belarus in 2011–2014 is shown in the table 3.

Table 3

Share of industry in the gross value added of the Republic of Belarus of value added in 2011 and 2014, %

Sector	Share of the value added generated by industrial sectors in the gross value added		Change
	2011	2014	
Manufacture of food products, beverages and tobacco	4,7	5,9	1,2
Manufacture of textiles, wearing apparel, dressing and dyeing of fur	1,8	1,3	–0,5
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	0,5	0,3	–0,2
Manufacture of wood and of products of wood and cork	0,8	0,7	0,1
Manufacture of paper and paper products. Publishing, printing	0,8	0,5	–0,3
Manufacture of coke, refined petroleum products and nuclear fuel	1,9	1,6	–0,3
Manufacture of chemicals and chemical products	7,3	5,3	–2,0
Manufacture of rubber and plastics products	1,3	1,0	–0,2
Manufacture of other non-metallic mineral products	1,6	2,1	0,5
Manufacture of fabricated metal products, except machinery and equipment	2,6	1,3	–1,2
Manufacture of machinery and equipment n.e.c.	3,6	2,3	–1,3
Manufacture of electrical machinery and apparatus n.e.c	1,6	1,1	–0,5
Manufacture of motor vehicles, trailers and semi-trailers	2,5	0,8	–1,7
Other sectors of manufacturing	1,1	0,9	–0,2
Electricity, gas and water supply	1,9	3,3	1,3
Mining	1,3	0,9	–0,4

Note. Author's development according to [2].

In 2011 the largest shares in the gross value added of the Republic of Belarus were accumulated by "manufacture of chemicals and chemical products", "manufacture of food products, beverages and tobacco"; "manufacture of machinery and equipment n.e.c.", "manufacture of fabricated metal products, except machinery and equipment", "manufacture of motor vehicles, trailers and semi-trailers". In 2014, the leaders among the industries in the value of this indicator were "manufacture of food products, beverages and tobacco", "manufacture of chemicals and chemical products", "electricity, gas and water supply", "manufacture of machinery and equipment n.e.c.", "manufacture of other non-metallic mineral products".

The largest increase in the share of value added in gross value added in 2011–2014 showed the following sectors: "electricity, gas and water supply", "manufacture of food products, beverages and tobacco". Slightly increased the shares of "manufacture of other non-metallic mineral products" and "manufacture of wood and products of wood and cork" in gross value added. Other sectors decreased their shares in the structure of gross value added. The largest decline in the share was demonstrated by "manufacture of chemicals and chemical products", "manufacture of motor vehicles, trailers and semitrailers", "manufacture of machinery and

equipment n.e.c.”; “manufacture of fabricated metal products. This tendency can signalize about the decline in effectiveness of industrial performance and the possibility of its enhancement.

Percentage of added value in the industrial sector output. An important indicator for evaluating the efficiency of industrial sector’s performance structure is the share of value added in gross output of the industry sector. This figure can be served as indicator of quality assessment and production efficiency: the higher is the share of value added in gross output of the industry, the more efficient is industry sector’s performance and better quality control of production processes. The shares of value added in gross output by industry sectors are shown in the table 4.

Table 4

Shares of value added in gross output by industry sectors, %

Sector	Percentage of added value in the industrial sector output		Change
	2011	2014	
Manufacture of food products, beverages and tobacco	20,0	24,9	5,0
Manufacture of textiles, wearing apparel, dressing and dyeing of fur	42,2	40,9	–1,3
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	42,1	38,5	–3,6
Manufacture of wood and of products of wood and cork	40,8	34,4	–6,4
Manufacture of paper and paper products. Publishing, printing	33,4	31,8	–1,6
Manufacture of coke, refined petroleum products and nuclear fuel	6,5	10,1	3,6
Manufacture of chemicals and chemical products	47,1	54,1	7,0
Manufacture of rubber and plastics products	25,7	29,0	3,3
Manufacture of other non-metallic mineral products	27,5	38,5	11,0
Manufacture of fabricated metal products, except machinery and equipment	27,1	20,2	–6,9
Manufacture of machinery and equipment n.e.c.	33,3	30,8	–2,5
Manufacture of electrical machinery and apparatus n.e.c	33,3	33,2	–0,2
Manufacture of motor vehicles, trailers and semi-trailers	33,1	23,7	–9,4
Other sectors of manufacturing	35,3	33,9	–1,4
Electricity, gas and water supply	19,3	38,2	18,9
Mining	65,9	60,8	–5,2

Note. Author’s development according to [2].

The average value of sector value added in total industrial sectors’ output in Belarusian industry is 15–30 %. Among the industries with a high level of share of value added in total industrial sectors’ output (over 40 %) are mining, chemical industry, textile and clothing production. The lowest level of share of value added in total industrial sectors’ output demonstrated “manufacture of coke, refined petroleum products and nuclear fuel”. Besides it should be admired the growth in 2011–2014 in the value added share in following sectors: “electricity, gas and water supply”, “manufacture of other non-metallic mineral products”, “manufacture of chemicals and chemical products”, “manufacture of food products, beverages and tobacco”. The increase in value added share in total industrial sector’s output indicates about improvement in sector’s performance and more efficient and effective use of its resources. Decrease of the value added share can be recognize as a symptom of negative tendencies in sector’s management and its production performance. The greatest decline of value added share in total industrial sector’s output was demonstrated by Manufacture of motor vehicles, trailers and semi-trailers, “manufacture of fabricated metal products, except machinery and equipment”, mining.

To summaries the impact of all structural changes in industrial performance of Belarus it is necessary to make the complex analyses of investigated indicators (table 5).

Table 5

Top-5 industrial sectors in the values of investigated indicators (2014)

Shares of industrial sectors output in the gross output	Share of the value added generated by industrial sectors in the gross value added	Percentage of added value in the industrial sector output
Manufacture of food products, beverages and tobacco	Manufacture of food products, beverages and tobacco	Mining
Manufacture of coke, refined petroleum products and nuclear fuel	Manufacture of chemicals and chemical products	Manufacture of chemicals and chemical products
Manufacture of chemicals and chemical products	Electricity, gas and water supply	Manufacture of textiles, wearing apparel, dressing and dyeing
Electricity, gas and water supply	Manufacture of machinery and equipment n.e.c.	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
Manufacture of machinery and equipment n.e.c.	Manufacture of coke, refined petroleum products and nuclear fuel	Manufacture of other non-metallic mineral products

In 2014, according to the table 5, the leaders in the share of added value in the industrial sectors' output were not the leaders of shares of industrial sectors output in the gross output which indicates that the a significant amount of industrial production is produced by the sectors with average and low degree of value added in sector's output. We can make the conclusion, than industrial production in Belarus is characterized as extensive, which is based on increasing the volume of recyclable resources rather than innovations and technology development.

For structural changes improvements of industrial performance in the terms of industrial policy development following actions can be recommended:

- develop instruments for the organizational and technological improvements for sectors which are leaders in industrial output in order to enhance of using its capacity and value added increasing;
- should be paid attention for stimulation of output growth in the sectors with a high degree of added value in gross output. These sectors can be considered as "points of growth" of industrial development.

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