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APPROBATION OF THE METHOD OF SUBSTANTIATION OF THE SUBJECT AREA OF THE FORECAST OF SOCIAL AND ECONOMIC SECURITY OF THE INDUSTRIAL SECTOR

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АПРОБАЦИЯ МЕТОДИКИ ОБОСНОВАНИЯ ПРЕДМЕТНОЙ ОБЛАСТИ ПРОГНОЗА СОЦИАЛЬНО-ЭКОНОМИЧЕСКОЙ БЕЗОПАСНОСТИ ПРОМЫШЛЕННОГО СЕКТОРА

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Abstract. The current structure of the industrial sector of the Republic of Belarus, statistical data on the dynamics of the sectoral structure, the structure of exports and imports of the main commodity groups in the context of the CIS countries and other countries were used for testing the methodology. At the same time, their sectoral identification was carried out for the exported commodity group in order to guarantee the unity of the method of post-segment evaluation. For industry dispersal, a method of ranking is used and the purpose of the product is provided, determined by the content of each segment. The rank of individual sectors of the economy in the sectoral structure of the industrial sector is established on the principle of a greater share in the output of the industrial sector.

Аннотация. Для апробации методики применена существующая на текущий момент структура промышленного сектора Республики Беларусь, статистические данные о динамике отраслевой структуры, структуре экспорта и импорта основных товарных групп в разрезе государств СНГ и иных государств. При этом по экспортируемой товарной группе проведена их отраслевая идентификация с тем, дабы гарантировать единство способа посегментной оценки. Для отраслевого рассредоточивания применен способ ранжирования и предусмотрено предназначение продукции, определяемое содержанием каждого из сегментов. Ранг отдельных секторов экономики в отраслевой структуре промышленного сектора установлен по принципу большего удельного веса в выпуске продукции промышленного сектора.

Keywords: socio-economic security, government; society, enterprise; employee, threat, security, interests, economics, analysis, system.

Ключевые слова: социально-экономическая защищенность, государство, общество, предприятие, работник, угроза, защищенность, интересы, экономика, анализ, система.

The current structure of the industrial sector of the Republic of Belarus, statistical data on the dynamics of the sectoral structure, the structure of exports and imports of the main commodity

groups in the context of the CIS countries and other countries were used for testing the methodology. At the same time, their sectoral identification was carried out for the exported commodity group in order to guarantee the unity of the method of post-segment evaluation (Tables 1–2). For industry dispersal, a method of ranking is used and the purpose of the product is provided, determined by the content of each of the signatures. So, in table 1. the rank of individual sectors of the economy in the sectoral structure of the industrial sector is established on the principle of a greater share in the output of the industrial sector and is indicated by U_i .

Table 1.

THE DYNAMICS OF THE SECTORAL STRUCTURE OF THE INDUSTRIAL SECTOR
 OF THE REPUBLIC OF BELARUS FOR THE PERIOD 1990–2017

Industrial sectors	Specific weight of products of individual industries by year, %					Rank of individual industries by year (U_i)			
	1990	1998	2005	2017	Index of change 1990 to 2017	1990	1998	2005	2017
Industrial sector, total	100	100	100	100	×				
Electric power and fuel segment	7.2	18.1	26.2	29	4.02	U4	U2	U1	U1
Ferrous metallurgy	0.9	2.4	2.9	4,2	4.4	U8	U8	U8	U5
Chemical and petrochemical	9.0	14.3	12.5	10.1	1.12	U5	U4	U4	U4
Mechanical engineering and metal working	34.2	23.3	20.5	21	0.61	U1	U1	U2	U2
Forest, woodworking and pulp and paper segment	4.4	5.3	5.0	3.0	0.68	U6	U6	U6	U8
Building Material Segment	3.7	5.1	3.4	3.1	0.83	U7	U7	U7	U7
Light industry	17.2	8.0	8.4	4,0	0.23	U2	U5	U5	U6
Food segment	14.9	17.9	17.3	14	0.94	U3	U3	U3	U3

Source: author's development based on data (1–2).

Table 1. it is possible to determine that during the stage of 1990-2017 in the sectoral structure of the industrial sector of the Republic of Belarus there was a change of dominant segments. In particular, the higher rank (U1) since 2005, received the fuel and energy segment. Belarusian researchers explain this situation by the fact that due to the use of internal resources of the state and measures to increase production capacity in the fuel and energy segment, the production of fuel and energy resources has increased [1]. But the main change is caused by the price point — the rise of tariffs for these resources on the global market. By 2017, the grade of metallurgy increased from U8 to U5. The rank of machine–building and metal–working segments decreased (from U1 to U2), while the remaining segments retained the rank. The invariability of the rank of a number of segments can be explained by the demands of the domestic market, the stability of consumers and state regulation of tariffs for socially important products. The results of the ranking of export-oriented segments of the industrial sector of the Republic of Belarus are given in Table 2.

Analysis of the table shows that the rank of economic sectors exporting products to the CIS and other countries does not match. In particular, the maximum rank of exporting products to the CIS countries is machine–building and Metalworking (SE1), metallurgy (SE2), petrochemical and chemical segments (SE3). The rank by the years of the period of these economic sectors remains

constant. The maximum rank of sectors of the economy exporting products to other countries is assigned to the sectors of the extractive segment (DE1), petrochemical and chemical segment (DE2), metallurgy (DE3). It remained constant during the period 2000–2017.

Table 2.

DYNAMICS OF THE STRUCTURE OF EXPORTS OF THE MAIN COMMODITY GROUPS OF THE REPUBLIC OF BELARUS, % FOR THE PERIOD 2000–2017 AND ITS INDUSTRY RANKING

Export product	Identification of the industrial sector segment	In CIS countries, by year			Rank (SEi)	In other countries, by year			Rank (DEi)
		2000	2008	2017		2000	2008	2017	
Mineral product	Electric power and fuel complex	10.7	5.0	6.4	SE 6	34.5	59.4	65.7	DE1
Chemical segment products	Chemical and petrochemical	11.4	9.3	9.9	SE 3	22.2	15.8	13.0	DE 2
Wood and wood products	Forest, woodworking and pulp and paper segment	4.1	3.8	3.4	SE 7	4.6	3.2	2.2	DE 6
Textiles and textile products	Light industry	10.8	7.8	7.2	SE 5	10.2	4.3	3.3	DE 4
Base metals and articles thereof	Ferrous metallurgy	6.2	8.9	9.0	SE 4	8.8	6.4	7.0	DE 3
Machinery and equipment	Mechanical engineering and Metalworking	15.5	17.9	17.8	SE 2	3.7	1.9	1.5	DE 7
Means of transport	Mechanical engineering and Metalworking	18.8	19.0	20.1	SE 1	4.5	3.6	2.9	DE 5

Source: elaboration of the author based on data (2, c. 257).

Industry identification of imported products and ranking are presented in Table 3.

Table 3.

DYNAMICS OF THE STRUCTURE OF IMPORTS OF THE REPUBLIC OF BELARUS, % FOR THE PERIOD 2000–2017 AND ITS INDUSTRY RANKING

Import group	Identification of the industrial sector	In CIS countries, by year			Rank (SIi)	To other States, by year			Rank (DIi)
		2000	2008	2017		2000	2008	2017	
Mineral product	The power and fuel segment	43.2	50.1	53.2	SI1	1.1	0.9	1.0	DI5
Chemical industry products	Chemical and petrochemical	10.8	8.0	8.2	SI3	21.5	19.1	19.5	DI2
Base metals and articles thereof	Ferrous metallurgy	14.3	14.4	14.1	SI2	8.1	5.2	4.3	DI4
Machinery, equipment and mechanisms	Mechanical engineering and Metalworking	8.2	8.8	7.7	SI4	24.4	28.9	29.2	DI1
Means of transport	Mechanical engineering and Metalworking	3.0	2.7	2.6	SI5	7.5	12.0	13.1	DI3

Source: elaboration of the author based on data (2, c. 242).

According to the table, a higher rank in imports from the CIS countries in 2017 contains products of the mining segment and metallurgy (SI1), which is caused by the demands of many sectors of the economy in natural resources and metal. First of all, this applies to mechanical engineering and metal processing, producing metal-intensive products. Imports of products related to mechanical engineering and metal processing, in 2017 was awarded the rank of SI4, and products

of petrochemical and chemical signatures — the rank of SI3. Among the imports in 2017 from other countries, the rank DI1 (the highest) belongs to the products of engineering and Metalworking. For the state, which is actively carrying out the modernization of the technical base of the production process, this precedent is considered as a positive phenomenon, provided that the imported equipment is considered modern. Products of petrochemical and chemical segments were awarded the rank of DI2. A significant grade of products of this segment is explained by the need for foreign raw materials for the work of chemical economic entities and other industries of the Republic of Belarus.

The assessment of dispersion of characteristics of the industrial sector of the Republic of Belarus allows to perform their segmentation in this way (Table 4).

Table 4.

SEGMENTATION OF THE INDUSTRIAL SECTOR ON THE BASIS OF THE GRADES
 OF THE SEGMENTS OF THE INDUSTRIAL SECTOR IN 2017

<i>Integrated segments of the industrial complex</i>	<i>Segments of the industrial sector</i>	<i>The grade of the segment</i>				
		<i>Ui</i>	<i>SEi</i>	<i>DEi</i>	<i>SIi</i>	<i>DIi</i>
Technical and technological	The power and fuel segment	U1				
	Mechanical engineering and Metalworking *	U2				
	Chemical and petrochemical	U4				
	Ferrous metallurgy	U5				
Social	Food segment	U3				
	Light industry	U6				
Communication	The power and fuel segment		SE6	DE1	SI1	DI5
	Mechanical engineering and Metalworking		SE1	DE5	SI4	DI1
	Chemical and petrochemical		SE3	DE2	SI3	DI2
	Ferrous metallurgy and mining segment		SE4	DE3	SI2	DI4
	Light industry		SE5	DE4	×	×

Note. * In addition to the segments that produce consumer goods.

Source: elaboration of the author based on data [2–14].

The table is made in the context of the considered segments on the basis of the generality of the industrial composition of the core of technological structures of 4 and 5 values. A significant rank of these sectors of the economy in the industrial structure of the industrial grid of the Republic of Belarus and the possibility of increasing the rank presented an opportunity to note the technical and technological sector of industry, which is integrated components of the fuel and energy, engineering and Metalworking, petrochemical and chemical segments and metallurgy. The technical and technological sector of the industry stands out for its scale, because it is formed by segments that make a great contribution to the creation of industrial sector products. The public sector consists of segments that are aimed at the production of socially important products, have an end customer and maintain a stable rank in the industry structure: light, food, forestry, wood and pulp and paper industry. Without paying attention to the fact that the sector stands out for the smallest scale, a set of sectors of its components forms the basis for the formation of internal sources of maintaining the independence of the state and significantly determines the food security. In accordance with this, the communication sector includes segments of engineering and metal processing, petrochemical and chemical segments, metallurgy and mining segment, as well as light

industry. The study of the composition of the sectors of the economy of the provided section and their ranks allows us to see that the sectors of the economy of mechanical engineering and metal processing, as well as mining sectors of the economy and metallurgy have the greatest ability to “include” in the system of world economic relations. This is explained by the resulting specialization of the industrial sector of the Republic of Belarus. It should be noted that the products of individual sub-sectors of engineering stands out for the highest knowledge intensity (instrument-making, radio engineering, electrical, optical-mechanical, electronic) [15–16]. As a result, its significant rank in export operations is considered as an additional probability of using competitive advantages for the modern development of the Republic of Belarus. At the same time, the presence of the same rank of steel products and mining sectors of the economy in import operations reflects the emerging dependence of the raw material base segments of the industrial sector of the country on imports.

Comparison of data development groups, economic sectors, distributed according to the stages of competitive lifting have shown that promptly develop segments attributable to both financial and inventive stage. Thus, in 2017, the mass index of fuel and metallurgy products amounted to 109%, petrochemical and chemical segments 107%, engineering and metal processing — 115%, production of building materials — 108%. But the mass index of the basic product — the electric power industry — was 99.7%. This suggests that there is a possibility of a “narrowing of security” in the near future. In other words, the resource factors in the Republic of Belarus are guaranteed and maintained a rational degree of protection. At the same time, the assessment of the resistance parameter of the provided value shows that the indicator is considered conditional, because the state does not have enough internal sources for long-term assistance of the formed industry ratios. An additional indicator in the assessment of the stabilization stability of the structure of the industrial sector is the coefficient of structural changes. Calculations of this coefficient for the industrial sector of the Republic of Belarus are given on the basis of (1). His assessment indicates a decrease in the intensity of structural changes and the direction to the stabilization of the structure. The more distinct trend is noticeable in the dynamics of the generalizing coefficients, for the calculation of which the number of industrial and production personnel is used. The intensity of structural changes was reduced throughout the study period [17–18].

Valuation based on the price of fixed assets is the least correct, which is explained by the imperfection of methods for revaluation of fixed assets.

Thus, as of 2017, stability in the industrial sector was insufficient. The evolutionary stability was partly recorded by comparing the sectoral composition of the emerging “core” of the modern technological structure in the economy of the Republic of Belarus and the leading countries of financial and economic development.

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