

DYNAMICS OF SPACE ORGANIZATION OF WORLD INDUSTRY

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Key words: manufacturing industry, high technology manufacturing industries, high-tech (HT) production, space organization of world industry, world industry, structural shifts.

The modern world industry differs by a difficult and rather diversified structure. The ongoing changes in the structure of the industrial sector of developed economies by their nature differ from those which occur in developing countries. Also these changes differ by speed and nature due to regions' size.

CHANGES IN THE STRUCTURE OF THE WORLD INDUSTRY

The implementation of new technologies and other scientific and technical progress achievements into the production process, the boost of efficiency and quality indicators of production in different countries were quick to reflect on changes of branch structure of manufacturing industry in the world. Many new industries were formed (bioindustry, manufacture of laser technology, modern medicine and microbiological drugs, etc.). Technological innovations gave birth to microelectronics. Therewith some well-defined stabilization and even a slight decline in production in “traditional” industries of developed countries were observed. Highest growth rates were noticed in production of means of communication (radio, television and communications equipment), computer and office equipment, electrical equipment.

Among the developing countries, the most intensive processes occurred in recent decades in China, Mexico, Brazil, India and “new industrialization” Asian countries, where the same engineering sub-industries were highlighted. Though in the group of less developed countries the most significant growth rates were observed in traditional for these countries industries – food and beverages, textiles.

Specific processes occurred in the same period in post-Soviet space, particularly in the CIS countries, which restructured the entire economic complex by passage “from plan to market” .

Data provided in the following table (table 1) illustrate the obvious increase in share of communications (radio, television and communication equipment) in structure of the world manufacturing (structure of MVA) and in selected country groups.

Table 1

*Structure of manufacturing value added (MVA) in selected country groups
(in %)*, 1995–2008¹*

ISIC (Rev. 3) – Branch	Industrialized countries without CIS		CIS countries		Developing countries		World	
	1995	2008	1995	2008	1995	2008	1995	2008
Food and beverages	11,0	7,8	16,9	17,2	17,3	15,9	12,2	9,0
Tobacco products	0,5	0,2	0,3	0,7	2,9	1,9	1,0	0,5
Textiles	2,4	0,9	2,4	1,5	6,6	4,0	3,2	1,4
Wearing apparel, fur	2,6	0,7	1,5	1,1	3,5	2,7	2,7	1,0
Leather, leather products and footwear	0,8	0,2	0,8	0,5	1,3	1,0	0,9	0,3
Wood products (excl. furniture)	2,5	1,5	1,9	1,6	1,8	1,3	2,3	1,5
Paper and paper products	3,7	2,4	3,2	3,0	2,3	2,5	3,5	2,4
Printing and publishing	6,0	3,8	0,8	1,5	2,0	2,0	5,2	3,6
Coke, refined petroleum products, nuclear fuel	3,3	2,3	5,8	4,2	8,3	7,1	4,2	2,9
Chemicals and chemical products	10,0	8,6	8,9	7,6	10,3	12,2	10,1	9,1
Rubber and plastic products	3,3	2,5	1,8	3,0	3,2	3,7	3,2	2,7
Non-metallic mineral products	4,0	2,6	8,8	6,6	6,3	4,8	4,5	3,0
Basic metals	5,3	3,8	14,2	13,7	6,5	5,7	5,7	4,2
Fabricated metal products	7,2	5,2	3,8	5,0	4,1	3,6	6,6	5,0
Machinery and equipment, etc.	9,5	7,5	12,0	10,2	4,9	4,4	8,7	7,2
Office, accounting and computing machinery	1,0	4,2	0,1	0,3	1,0	2,2	1,0	3,9
Electrical machinery and apparatus	4,4	3,9	3,2	3,0	2,7	3,8	4,0	3,9
Radio, television and communication equipment	5,8	27,4	0	0,5	5	9,9	5,6	24,6
Medical, precision and optical instruments	2,5	2,5	1,6	7,1	0,6	0,9	2,1	2,4
Motor vehicles, trailers, semi-trailers	7,7	6,8	4,8	4,7	5,0	4,8	7,2	6,5
Other transport equipment	2,5	2,3	4,6	4,7	1,8	4,1	2,4	2,5
Furniture manufacturing, etc.	4,0	2,9	2,6	2,3	2,6	1,5	3,7	2,4

* Percentage shares of individual branches in total MVA at constant 2000 prices.

According to: UNIDO INDSTAT4 2010. Industrial Statistics Database at the 4-digit Level of ISIC (Revision 2 and 3), 2010 (<http://www.unido.org/index.php?id=4879>).

¹ It is necessary to notice that the analyzed data (UNIDO INDSTAT4 2009. Industrial Statistics Database at the 4-digit Level of ISIC - Revision 2 and 3) has considerable disadvantages. The data of the branch structure of industry of the countries and world regions is not absolutely exact.

Changes in the industrial structure of developed countries, which are entering the new post-industrial stage, in essence, determined the structural changes in the global industry.

As for the developing countries, the structure of their industry also changed. But especially noticeable changes have occurred due to changes in only a few of them, such as Brazil, Mexico, the Asian NICs of the “first” and “second wave” (Korea, Singapore, Malaysia, Thailand and others). At the same time in the industrial structure of these states occurred the shift toward development of knowledge-intensive branches. The proportion of developing countries in manufacturing in the world over the past decade increased significantly. Thus China, Asian NICs and other states (with priority to manufacturing industries) significantly strengthened their positions in the global economy.

To summarize it all up, we are noting the following. In most developed countries, changes in the structure of industrial production (before the current financial and economic crisis in the global economy since 2008) were a process of gradual restructuring and adjustment of the economy through the introduction of scientific and technological progress in the transition to post-industrial stage of development due to increasing income of population. Priority is given, in the first place, to the most high-tech industries and branches. In the CIS countries (and many other countries with the same “transition economies”) ever since the early 1990s, changes in the structure of industry has identified the transformation of the economic mechanism and the restructuring of the economy, and now, because of that they reflect general economic problems of this type of countries. For groups of less developed countries structural changes in the industrial sector of the economy expressed in the process of changing the organization and methods of production in large-scale changes in productivity and in the industrial structure due to the deeper involvement of these countries in international division of labor. The multinational companies also have strong influence on the placement of production facilities on their territory, which strongly came through, for example, in changing of industrial structure in Asian NICs with their export-oriented economies. And in the less developed countries of the world there were no significant changes in the industrial structure.

LEADERS OF THE WORLD MANUFACTURING

Most of the technological capacity and industrial production (in value terms) remain concentrated in the developed countries (70 %). At the same time very significantly increased its share in world manufacturing value added (MVA), China took the third place in the world ranking, primarily due to the rapid growth of gross production (table 2).

Informatization, according to the leaders of China, is an important strategic resource element, determining the prospects of the entire economic and social modernization. It is worth emphasizing the fact that the position of China in the world economic system that had previously been provided mostly by low production costs in the supply of products to foreign markets shallow redistribution (textiles, sportswear, toys), now occur due to increased export earnings from trade in high-tech products. The current situation in Russia, by contrast, is characterized by a lag in the development of high-tech sector of the economy. Our country is a consumer of the simplest

Table 2

*Top 10 of the world manufacturing (world MVA) and Russia, 2008
(at constant 2000 prices)*

Country	Country's share in world MVA, %	MVA as percentage of GDP	Country's share in world manufactured exports, %	MVA per capita, at constant 2000 US \$ prices
1. USA	20,5	12,2	9,1	4602,4
2. Japan	16,4	22,0	5,9	8895,5
3. China	13,3	35,3	11,3	688,7
4. Germany	6,5	21,4	10,6	5415,5
5. The Republic of Korea	3,2	29,3	3,4	4549,1
6. France	3,0	13,7	4,4	3339,1
7. Great Britain	2,7	10,8	3,0	3080,9
8. Italy	2,7	16,2	4,2	3212,2
9. Brazil	1,8	14,4	1,1	631,0
10. Canada	1,7	13,6	2,4	3582,2
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Russia	1,2	18,5	1,5	569,6

According to: UNIDO INDSTAT4, 2010. Industrial Statistics Database at the 4-digit Level of ISIC (Revision 2 and 3), 2010 (<http://www.unido.org/index.php?id=4879>).

and most popular technologies. In the present rating of our country occupies 15th place, and it accounts for only about 1% of world production of manufacturing industries.

The data presented above (table 2) illustrate the differing performance of leading countries on such indicators as MVA as percentage of GDP, MVA per capita at constant 2000 US \$ prices, country's share in world manufactured exports (%). The analysis shows that yet again Russia has no advantages (we have a ten-fold gap from the leaders). For example, in Japan's index of MVA per capita data for 2008 correspond to 8895 dollars (at constant 2000 US \$ prices), in Singapore – 7430 dollars, in Switzerland – 6722 dollars, in the USA – 4602 dollars to compare this figure (US \$): Mexico – 1093, China – 689, Brazil – 631, Russia – 570 (UNIDO INDSTAT4, 2010).

It is worthwhile noting also that the 30 top leaders of the world industry account for approximately 90 % of world production of manufactures (and the share of the first 15 countries – 80 %), indicating a high level of concentration of production capacity in a group of leading countries. In this group of leading countries, except China, are already South Korea, Brazil, Mexico and India. And followed by Argentina, Indonesia and Thailand, which have overtaken Sweden, the Netherlands, Australia, Switzerland and many other developed countries. In the countries that create and widely use in practice innovative technology and their diffusion in the branches of parent TNCs worldwide, per unit of capital in the manufacturing industry there is many times as large output in value terms than in capital-intensive extractive industries and manufacture of the lowest redistributions.

In other words, the most impressive results were achieved by the countries that have managed to put at the service of national economic benefits of the globalization of world markets for high-tech products, where winning a strong position gives a significant profit as compared to domestic production costs of high technology products and services (the so-called technological rents).

Information technologies (IT) play the greater and greater role in the world economy, moreover, a so-called “digital rupture” that is a backlog of the poorest countries from the rich ones by volumes and quality of use of these technologies is gradually reduced.

The countries of East and South East Asia in which the share of the high-tech goods in the export structure is ten times more and, besides, promptly grows, make a serious competition not only to Russia, but also to many large world exporters, as a result replacing their hi-tech export with low-tech products, mainly raw.

In the conditions of open economy the Russian goods noncompetitive on foreign markets, quickly lose competitiveness on internal ones, being superseded by import. In these conditions the whole branches start to lack financial resources that sooner or later leads to their irreversible technological degradation or a total disappearance.

If radical measures to innovative economy are not undertaken on transition, Russia and other CIS countries can remain at the level of the developing states (and not such as China or the newly industrialized economies of South East Asia), basically exporting raw and energy resources. It is necessary to create the innovative economy of the Commonwealth of Independent States by common efforts, through modernization of industrial and technological base, labour productivity growth.

Under the conditions of the modern crisis the necessity of the transition to the innovative model on the basis of the interstate cooperation has sharply appeared and its synergetic effect will help the CIS countries to pass to a higher technological way. In other words, the use of intellectual, scientific and technical and technological potential of the last years without its escalating and development in modern Russia and other CIS countries dooms the industry and economy of our countries to an inevitable and accruing backlog. Thus it is worth to remember that it occurs as the process of practical use of the scientific knowledge embodied in innovations accelerates, scientific and technical and technological possibilities of variety of the countries, not only advanced, strengthen.

At the same time in modern Russia the simple use of the intellectual, technical, scientific and technological capabilities of previous years without its building and development dooms the industry and economy to the inevitable and growing backlog. It is worth remembering that this is happening against a background of accelerating the practical application of scientific knowledge embodied in the innovation and strengthen scientific and technological capabilities of many countries not only economically highly developed.

Now leading positions in world ranking in the production of hi-tech goods are still occupied by highly-developed countries and China (table 3).

Leading positions in world ranking in the export of hi-tech production are occupied by highly-developed countries including EU (especially including trade between EU countries). But it is necessary to note that China has taken 1st place (with 21,4 %, 2008) leaving behind USA and Japan. And even excluding trade between China and Hong Kong the share of China exceeds 15 % of the world indicator. This share equals

Table 3

Production of high-technology goods by region/country/economy: 1985–2007 (%)

	Region/country/economy	1985	1990	1995	2000	2005	2007
1	USA	42,3	31,2	29,1	34,5	29,8	30,7
2	China (including Hong Kong)	3,1	2,3	2,6	4,1	10,0	13,7
3	Japan	18,5	23,6	26,8	21,4	15,0	10,6
4	Germany	7,8	8,0	6,4	5,1	6,9	7,0
5	Korea, South	0,9	1,8	3,5	3,8	4,8	4,7
6	Great Britain	4,4	5,7	4,5	4,6	4,4	4,3
7	France	3,8	4,5	4,3	3,6	3,6	3,5
8	Italy	3,1	4,5	2,6	2,2	2,6	2,5
9	Taiwan	0,7	1,2	1,7	2,7	2,5	2,0
10	Brazil	2,0	1,9	1,8	1,5	1,4	1,6
	EU	24,3	29,2	24,2	21,6	25,3	25,1
	NAFTA (USA, Canada, Mexico)	44,9	33,7	31,2	37,8	32,8	33,5

According to: Science and Engineering Indicators – 2010. (Appendix: tables 6–18). Two volumes. Arlington, VA: National Science Foundation, 2010.

to the volume of trade of such goods between all 27 countries within EU. Asian NIC (newly industrialized countries) of the first and second wave have considerable share in world export of hi-tech production (table 4).

The total share of China (including trade with Hong Kong) and Asian NIC has exceeded 40 % and a total share of all Asian countries – 50 % of world indicator. Thus it is necessary to consider that even under the conditions of present world financial crisis the rates of growth of China haven't considerably decreased (especially in comparison with other countries of the world).

In 2010 by volume of GNP on purchasing power parity (PPP) 1st place is occupied by the USA and Japan has fallen on 3rd line in the world rating having conceded 2nd position to China (<http://www.cia.gov>). China has also left behind Japan on total industrial output, such conclusion is contained in the published statistical report of the UNIDO. Following the results of 2009 the share of China has increased in the world industrial production up to 15,6 % (Japan – 15,4 %, the USA – 19 %). But according to forecasts, China in 2011 will overtake the USA on the given indicator and will come out on top in the world ranking (www.criussian.ru).

Nowadays China is the world leader: in steel manufacture (about 50 % of world release), cement (60 %), toys (75 %), mineral fertilizers (35 %), TVs (48 %), etc. At the same time only 26 % of total volume of Chinese production accounts for high value-added – that is 22 % less, than in the USA and Japan, and 11 % less, than in Germany. But the situation gradually changes, the epoch of the cheap Chinese goods comes to an end, China faces a new level of development of manufacture. In 2009 China has for the first time overtaken the former leader Germany in volume of export

Table 4

Exports of high-technology goods by region/country/economy: 1995–2008 (%)

Region/country/economy	1995	2000	2005	2008
World	100,0	100,0	100,0	100,0
World excluding intra-EU and intra-China/ Hong Kong	80,0	80,1	77,8	78,4
EU (total)	31,1	30,0	31,0	29,3
Intra-EU	18,1	17,5	16,9	15,7
EU ROW	13,1	12,5	14,0	13,6
China and Hong Kong (total)	6,9	8,5	18,2	21,4
China and Hong Kong (ROW)	4,9	6,0	12,9	15,6
Taiwan	4,1	5,0	5,3	5,2
Singapore	6,8	5,3	5,1	5,2
Korea, South	4,2	4,6	4,8	4,7
Malaysia	4,0	4,2	3,6	3,3
Thailand	1,5	1,5	1,5	1,6
Philippines	0,6	1,9	1,3	1,3
Indonesia	0,3	0,6	0,4	0,4
United States	17,0	17,2	11,5	10,7
Japan	14,7	10,4	7,0	6,4
CIS	0,1	0,2	0,3	0,4

According to: Science and Engineering Indicators – 2010. (Appendix: tables 6–18). Two volumes. Arlington, VA: National Science Foundation, 2010.

of goods and export of hi-tech production. Thus China has already come out on top position in the world in volume of foreign trade and export of production of mechanical engineering and electronics (1590 bln dollars and 933,4 bln dollars accordingly). In 2010 mechanical engineering and electronics production amounted to 60 % of total export of China (www.cirussian.ru, February 2011).

CONCLUSION

The hi-tech production and information technology play an increasing role in world economy, therefore those countries which will use advantages of globalization of the world markets of hi-tech production will further achieve the most considerable results.

The Asian vector in the world industrial development is clearly presented. Though from the point of view of the characteristic of the spatial organization of industrial production at global level – disparities still remain on a line “North” – “South” (developed – developing countries).

Shifts in allocation of manufactures of extracting and manufacturing industry are very considerable. As a matter of fact the world industry faces the spatial re-grouping of regions dominating in the world industry in creation and an exchange of industrial production, distribution of capital, technologies and production capacities.

The former leader of the world industry, the North American region led by the USA, has lost its position. As a whole the European region (EU countries) has strengthened the positions in manufacturing industry. The CIS countries (including Russia) have very considerably weakened their positions in the world industry. Meanwhile the “Asian” or “Far East pole” has most actively declared itself, which has practically gained the leading positions in the world on manufacture of many kinds of industrial production (Japan, fast developing China, Republic Korea, Taiwan, Singapore, Malaysia, Thailand, etc.).

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ДИНАМИКА В ПРОСТРАНСТВЕНАТА ОРГАНИЗАЦИЯ НА СВЕТОВНАТА ИКОНОМИКА

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(Резюме)

Икономическият растеж и развитието на страните винаги са били свързани с промените в световните икономически структури. В статията се описват структурните промени в пространственото разпределение на световната индустрия. Подчергано е, че понастоящем увеличаващата се роля на знанието, конкурентните индустрии на световния пазар и техният извънреден растеж в структурата на световното стопанство са доминираща тенденция, която се проявява в икономическото развитие на много страни.

В статията се отбелязва, че промените в локализацията на минодобивната и преработвателната промишленост са значителни. В световната индустрия се забелязва преразпределение на регионите, доминиращи в производството и търговията с промишлени продукти, разпределение на капитали, технологии и производствен капацитет. Ясно се фиксира азиатският вектор в световното индустриално развитие.