

**ПРОБЛЕМЫ РАЗВИТИЯ ВНЕШНЕЭКОНОМИЧЕСКИХ СВЯЗЕЙ И ПРИВЛЕЧЕНИЯ ИНОСТРАННЫХ ИНВЕСТИЦИЙ:
РЕГИОНАЛЬНЫЙ АСПЕКТ**

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THE PERSPECTIVES AND DIRECTIONS OF UKRAINIAN KNOWLEDGE-BASED AND TECHNICAL PRODUCTS EXPORT INTENSIFICATION

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Мезенцева Ю.О. Перспективи та напрямки інтенсифікації експорту науково-технічної продукції України.

У статті підкреслено важливість збільшення частки наукоємних продуктів у загальному обсязі експорту. Розглянуто основні тенденції на ринку експорту наукоємної продукції. Проведено аналіз динаміки частки наукоємної та високотехнологічної продукції у структурі українського експорту. Показано місце України на ринку високотехнологічної продукції в рамках країн СНД та світу в цілому. Запропоновано використання індексу інтенсивності експорту для короткострокового прогнозування. Такий індекс враховує сформовану тенденцію в сфері, що аналізується, і дозволяє об'єктивно порівняти показники інтенсивності експорту високотехнологічної продукції різних країн. Підраховано середній рівень експорту наукоємної продукції України на найближчі 5 років. Названо ключові проблеми та перспективи розвитку експорту науково-технічної продукції в контексті участі у світовій кооперації. Розглянуто позитивний і негативний сценарій розвитку подій в даній сфері в найближчі 5 років. Запропоновано заходи щодо інтенсифікації розвитку високотехнологічних галузей і збільшення обсягів експорту наукоємної продукції.

Ключові слова: експорт, наукоємна продукція, інтенсивність, технологічний обмін.

Мезенцева Ю.А. Перспективы и направления интенсификации экспорта научно-технической продукции Украины.

В статье рассмотрены основные тенденции на рынке экспорта наукоёмкой продукции. Проведен анализ динамики доли наукоёмкой и высокотехнологической продукции в структуре украинского экспорта. Показано место Украины на рынке высокотехнологической продукции в рамках стран СНГ и мира в целом. Предложено использование индекса интенсивности экспорта для краткосрочного прогнозирования. Такой индекс учитывает сложившуюся тенденцию в анализируемой сфере и позволяет объективно сравнить показатели интенсивности экспорта высокотехнологической продукции различных стран. Подсчитан средний уровень экспорта наукоёмкой продукции Украины на ближайшие 5 лет. Названы ключевые проблемы и перспективы развития экспорта научно-технической продукции в контексте участия в мировой кооперации. Рассмотрены позитивный и негативный сценарий развития событий в рассматриваемой сфере в ближайшие 5 лет. Предложены мероприятия по интенсификации развития высокотехнологических отраслей и увеличению объемов экспорта наукоёмкой продукции.

Ключевые слова: экспорт, наукоёмкая продукция, интенсивность, технологический обмен.

Myezyentseva Y. The perspectives and directions of Ukrainian knowledge-based and technical products export intensification.

The importance of increasing the share of knowledge-based products in the Ukrainian export is outlined in the article. The main trends in the export market of high technology products are considered. The dynamics of the high-tech products share in the Ukrainian exports structure are analyzed. The place of Ukraine on the CIS and the whole world markets of high-tech products is shown. The implementation of an export intensity index for short-term forecasting is proposed. This index takes into account the prevailing tendency in the analyzed sphere and allows to compare objectively the high-tech products export intensity data of different countries. The approximate level of high-tech products export of Ukraine during the following 5 years is calculated. The key issues and perspectives of knowledge-based and technical products export development are named in the context of participation in global cooperation. The activities for intensification of the high-tech industries development and for increasing knowledge-based products export are proposed.

Key words: export, high-tech products, intensity, technological exchange.

The relevance of the topic. The key components of modern innovation development of the world are progressive fundamental and applied science, effective educational system, access to the most up-to-date technology. The economies that possess this combination achieve efficient conversion of knowledge into new technologies. This ensures the effective development of these countries and their participation in the international knowledge-based and technological products exchange markets as a leading exporters, which is why the issue of high technology products exports is very important. Most researchers believe that modern civilization almost completely exhausted the extensive development factors and the intensive development factors are of the top priority, so the development of scientific and technological potential of Ukraine is extremely relevant nowadays.

The analyzed issue. During the years of independence of Ukraine the proper attention was not paid to the support and funding of "knowledge economy". That slows down the process of the country's integration into the global research and technical achievements exchange. The acceleration of technological products exports and scientific and technological activities intensity can provide self-financing of the industry, and thereby can increase the efficiency of all the involved processes (innovation, high-tech machinery production, scientific research funding).

Analysis of recent publications and researches. The aspects of innovation development of Ukraine are investigated by A. Halchynskiy, V. Geets, B. Kvasniuk, Y. Makogon, O.Salihova, V. Seminozhenko, S. Bobylev, I. Varyash, N. Ilysheva, S. Kuznyetsov, M.Poysyk and others. The problems of technological, innovation and economic development, issues of enterprises innovation strategy, the nature of economic growth towards 3 millenium; aspects of innovative default of Ukraine are analyzed in their works. Moreover, the focus is made on the high technology products exports perspectives. The effective ways of forming the structure of technological products exports and the integration of Ukraine into the global scientific and technological market are still being discussed due to the lack of high-tech industries development strategy [1, p.112]

Aim of the research. The aim is to study and to analyze the trends in exports of knowledge-based and technical products and the possible ways of Ukraine's future participation in the global scientific, technical and technological exchange

Results of the research. The economy of Ukraine, like any other country, depends both on the results of its operations in the domestic and external products and services markets. It is generally accepted that the export activity, foreign trade surplus characterize positively the economy of any country. Exports is a measure of how foreign countries influence on the growth of national GDP of the exporting country, and also determines the most competitive and developed spheres of the national economy in the context of the world tendencies. The product structure of Ukrainian exports and also the growth rate of the respective shares in total exports are presented in Table 1.

Table 1.

Product structure of Ukrainian exports in 2012, %			
№	Product groups	Share in total exports, %	Growth rate in 2012 comparing to 2011, %
1	Metals and metal products	26,4	-14,70
2	Plants	13,4	+66,6
3	Mineral products	11,1	-25,4
4	Mechanical and electrical machinery	10,2	+4,0
5	Vehicles, aircraft, watercraft	8,7	+22,8
6	Chemicals	7,4	-6,1
7	Fats and oils	6,1	+24,0
8	Foods	5,1	+18,9

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According to the data presented in Table 1, we can conclude that there is some reduction in exports of raw materials and semi-finished products, and there is a positive trend in exports of high technology products within the global trend of increasing scientific and technical cooperation importance and the development of high-tech market.

Models of innovation and science and technology governance are different. The USA focus on the world domination and innovative leadership, the EU countries first of all consider the prosperity of nations, China focuses on national interests and rigid discipline. In 2012, spending on research and innovation development (R&D) in China amounted to 2.42% of GDP (183.7 billion USD) in the USA - 2.81 %, in Japan and South Korea – 3,3%. Today 14.7% of researchers of the world live in China, 22.8% - in the United States, 11,7% - in Japan. Today's growth of Ukrainian GDP through the implementation of new technologies and innovative products trade is only 7.7 % (in the developed countries - up to 40 %). According to the competitiveness ranking of the World Economic Forum 2012-2013, Ukraine ranks 73 among 117 countries, which is 10 positions lower than in 2005. However, among all CIS countries Ukraine nowadays is second after Russia in terms of the volume of high-tech products exports to this market (10% of the market of the CIS, Russia - 81%) [2, p.12].

It is not reasonable to state that the export capacity of Ukraine in the field of high technology and high-tech products decreases sharply, because the potential of the state is comparable to that of Russia and China if we take into account the relative measures. However, taking into account the absolute figures, our country cannot compete with the world leaders, showing a slight slowdown in exports of that product (see Table 2).

Table 2

Exports of high technology and high-tech products from Ukraine in 2007 - 2012 [4]			
High technology and high-tech products export indicators	The volume of exports, th. US dollars	% comparing to previous year	Share in total volume, %
2012			
Total	120354682,2	133,5	-
Knowledge-based and high-tech products	12516886,9	130,5	18,4
2011			
Total	82186413,4	133,1	-
Knowledge-based and high-tech products	10380540,12	130,1	12,6
2010			
Total	65222217,6	129,6	-
Knowledge-based and high-tech products	8650450,1	125,2	13,3
2009			
Total	53397846,5	56,6	-
Knowledge-based and high-tech products	6674730,8	76,6	12,5
2008			
Total	66954429,8	135,8	-
Knowledge-based and high-tech products	4441162,9	127,4	9,5
2007			
Total	49248063,6	128,4	-
Knowledge-based and high-tech products	4976564,2	149,5	10,1

If we compare the exports of knowledge-based and high-tech products in leading countries of the world, particularly the USA, Japan, Germany, UK, China and Russia, it may be noted that Ukraine is definitely behind them in absolute figures (see Table 3).

Table 3

Exports of knowledge-based and high-tech products in the world and in Ukraine in 2012 [5]							
	USA	Japan	Germany	UK	Russia	China	Ukraine
Exports, bln. US dollars	881,1	721,3	513,0	426,2	451,3	768,1	120,3
Exports of knowledge-based and high-tech products, bln. US dollars	660,8	562,6	333,45	230,14	63,18	207,4	16,2
Share of knowledge-based and high-tech products	75%	78%	65%	54%	11%	27%	13,5%

If we take into account the average share of high technology products exports in Ukraine during 6 years (which is 11.4%), then Ukraine inferior to developed countries significantly. However, this situation is typical for the states with the resource-oriented export without creating simultaneously the conditions for the production of high-tech products, integration into the global economic environment, where the export and import position of the state in the sphere of high technologies is balanced.

The above average 11.4% is 1.3% higher than the same indicator in 2007, which determines the absence of fundamental structural changes aimed at stimulating the growth rate of high technology products exports.

The export intensity index can characterize the situation more precisely. It is proposed to be calculated as the ratio of relevant changes in exports in each year (%) to the previous year (%) (see Table 4).

Table 4

The level of export activity of Ukraine in the knowledge-based and high-tech products market in 2007 - 2012 [4]		
Year	Growth rate comparing to previous year,%	Export intensity index
2007	149,5	-
2008	127,4	127,4/149,5=0,852
2009	76,6	76,6/127,4=0,701
2010	125,2	125,2/76,6=1,634
2011	130,1	130,1/125,2=1,039
2012	133,5	133,5/130,1=1,026

According to the table, we can calculate the average index of export activity of Ukraine in the analyzed market using the formula:

$$I_{ei} = \sum Z_{iei} / N, (1)$$

where: I_{ei} - average index of export activity, $\sum Z_{iei}$ – the total of indexes of export activity, N – number of periods.

Thus, the average figure in 2007 - 2012 amounts to 1,24.

It is also possible to calculate that during the period from 2007 to 2012 (see Table 2.) Ukraine has exported knowledge-based and high-tech products for approximately 7.9 billion US dollars per year.

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So, preserving this tendency, in the next 5 years Ukraine will be able to increase exports of high technology products to 9.79 billion US dollars by the end of 2017.

The received data allows to predict the growth rate of exports of high technology products from Ukraine over the next five years using to the formula:

$$Tg = (Tgr - Tgp) : (Tgp : 100\%), (2)$$

where: Tg – growth rate, Tgr – real growth rate, Tgp – predicted growth rate.

This figure amounts to 24%.

At present, the high-tech products market volume is 4,3 trillion US dollars, moreover the market develops dynamically. In recent years, according to the Economic and Social Council of the UN, knowledge based and high-tech products trade grew by 6% per year and the global economic crisis did not affect this process significantly [6].

Seven highly developed countries of the world occupy the leading positions on this market (80%) and that were them who provided its average growth by 5.3 % per year in 2000 - 2012 years; only the growth leveled at 0.7 % was provided by other countries. At the same time, consistently high growth rates were provided by only 50-55 macrotechnologies in engineering, electronics, energy, computerizing and information systems.

In 2009 - 2010 market growth slowed down due to developed countries economies instability and was about 5.0% per year, and the share of other countries in providing the growth rose to 1.0 % per year. [5]

If the crisis will be overcome completely the trend of market growth by 6% per year will renew, and for 5 years it will amount to 30 %. However, there is also reason to believe that the leaders of the world economy will not be able to regain pre-crisis position in the coming years, and will ensure market growth at the level of 5.1 %, which equals to 25.5 % increase in 5 years-period. Thus, the overall market growth rate will exceed the rate of growth due to developed countries by 4.5 %.

It is necessary to mention that there will be some changes in the market, in particular in order to ensure the pace of development. Countries that are cannot be named as the leaders of the world economy, will ensure market growth by 1% more than the current trend, but only if they provide the market growth by 0.7% per year: $4.5\% - (0,7\% \times 5 \text{ years}) = 1\%$. This market share will create an impetus for new market situation and become an arena of struggle between the countries which intend to launch their knowledge-based and high-tech products to global markets. [3, p.201]

Having such rates of Ukrainian export growth, the market share will be somewhat reduced in relation to the highly developed countries (by 1.5% in 5 years). However in relation to the projected increase in the volume of world market Ukraine could lose its position by as much as 6%, as the market develops more rapidly than an export activity of Ukraine.

The loss of its market share by Ukraine may be due to an increase of innovation activity in China and Russia, which have the ability to press not only Ukraine, but also the developed countries, and to occupy the 1 % (calculated above) of the knowledge-base and high-tech products market, to offer competitive innovative products and world class services. [6, p.17]

In total preserving the predicted growth of 30% in the next 5 years, the world knowledge-base and high-tech products market will grow up to 5 trillion 590 billion US dollars.

Under these conditions, Ukraine's share on this market will be 0.2%. Today the figure amounts to 0.23%. So Ukraine in the coming years could lose: $0.2\% - 0.23\% = 0.03\%$ of the market, which is 1,677 billion US dollars.

Concerning the relevant aspects and problems of development in the sphere of high-tech products manufacturing and export, the following should be noted:

1. In Ukraine generally positive trend in high degree of technological processing products exports is formed. On the one hand, this indicates an increase in the processes of reproduction, on the other hand, it also tells us about the inertial dynamics of the dominant technological structure that uniquely characterizes the degree of success of the implemented economic policies.

2. By 2012 Ukraine ultimately has improved the dynamics of the high technology products export by increasing the level of its share in the value of exports by 2.7 % compared to 2000. The growth rate of high technology products exports in Ukraine in 2000-2012 were almost 1.6 times higher than in Russia.

3. There is a tendency of increasing the imports of high technology products in Ukraine.

4. The ratio of exports and imports of high-tech products is increasing annually in favor of the latter. Only in 2004 the ratio of high-tech products import to high-tech products export reached the highest level for the entire reviewed period and amounted to 0,73. This figure was due to the highest growth rate of total merchandise exports since 2000 (141.6 %).

5. Since 2000 there was more than five-fold increase in the volumes of intellectual rent paid to foreign trade partners by Ukraine for the purchased knowledge-based product. It seems that this increase can not be entirely attributed to large-scale modernization projects or fundamental qualitative changes. Taking into account the parameters (quantity and quality of implemented processes) of a real innovative activity of Ukrainian enterprises, this is just a slight improvement in this case.

Conclusions. Ukraine needs a long-term strategy of innovation breakthrough, despite the fact our country is the smallest player on the knowledge-based and high-tech products market. An urgent task is to preserve the existing market position, to increase the exports of the appropriate products in order to get a full inclusion in the global integration processes in the sphere of technical, scientific and technological exchange.

Moreover, the intensification of cooperation relations in a global scale will allow to adopt high-tech products manufacturing practices and their further use in subsequent processing steps; participation in students, academic, industrial projects together with international organizations will attract professionals from different countries and areas of activity to participate in the Ukrainian scientific projects; the formation of a national strategy for maintaining innovative component at all levels of national economic development will allow to rationally reallocate the internal financial resources and attracted foreign investment to ensure the development of high-tech industries.

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