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## PROSPECTIVES OF INNOVATIVE DEVELOPMENT OF UKRAINE'S ECONOMY

*In the article was considered the current state of the economy of Ukraine, was done the analysis of foreign trade operations, was determined innovation component of Ukraine's foreign trade. Was analyzed the place and role of Donetsk region in the formation of the export potential of the country, provided commodity and geographical structure of export operations. Following the results of the study was made conclusion about the necessity of changes in the technological structure of the industrial complex of Ukraine and substitution of industries that are based on outdated technological structures using a "breakthrough technology".*

*Keywords:* industry, economic growth, innovations, technological structure, modernization.

*Макогон Ю. Перспективы инновационного развития экономики Украины. Рассмотрено современное состояние экономики Украины, проведен анализ внешне-торговых операций, выделена инновационная составляющая внешней торговли Украины. Проанализированы место и роль Донецкой области в формировании экспортного потенциала страны, приведены товарная и географическая структура экспортных операций. По результатам исследования сделан вывод о необходимости изменения технологической структуры промышленного комплекса Украины и замещения производств, построенных на основе устаревших технологических укладов, с использованием "прорывных технологий".*

*Ключевые слова:* промышленность, экономический рост, инновации, технологический уклад, модернизация.

**Background.** The continuous improvement of the general state of Ukraine's economy that began in 2010 showed that the country has entered the path of post-crisis recovery. An important direction of public policy at this stage is to ensure the stability of positive economic results and creating conditions for further economic growth.

Globalization processes and development of post-industrial society require the use of technological developments in all areas of life. In highly developed countries, high technology has radically changed the structure of exports of finished products in favor of high-tech industries production. In order for production of national producers to take its rightful place in

foreign markets, main efforts of Ukrainian government should **be aimed** at supporting the development of high-tech industries that will promote economic growth. That is why the issue of Ukraine's accelerating technological development of the industry is essential.

The industrial potential of Ukraine is one of the backbone elements of the national economic system and society in general. The domestic industry ensures 45 % of the gross output and 25 % of jobs. Industrial companies ensure a significant share of state budget and social funds, wages for the working population, form the investment potential of the country, determine the direction of its innovative development. However, despite this, Ukrainian industry remains technologically backward, and therefore inefficient and uncompetitive. Significant degree of depreciation of fixed assets indicates the use of outdated and intensive means of production, which limits the realization of industrial potential [1].

Recent decade has seen increasing participation of Ukraine in the global world economic processes, which resulted in deeper economic relations of Ukraine with many countries in different regions of the world. However, the industry in Ukraine is losing its positions as for the output of innovative products, which indicates the increase in raw material component of Ukraine's exports.

**Analysis of recent research and publications.** Among domestic and foreign scholars who have dedicated their works to the problems of innovative component of foreign economic activity of Ukraine, firstly, should be mentioned O. Amosha [2], O. Saveliev [3], S. Glaziev [4], B. Novytskyi [5], Y. Pakhomov [6], B. Heits [7], L. Fedulova [8] and others.

The purpose of this study is to analyze the current state of Ukraine's economy, the structure of foreign trade operations of Ukraine, define the proportion of innovative production in Ukraine's exports and to emphasize problems of further development of innovative potential of Ukraine in the system of international cooperation.

**Results.** An indicator of the formation of an innovative economic development model, according to L. Fedulova [8] is a massive reproduction of innovative processes on a systematic basis, and depth of changes caused by them in all sectors of the economy, but with a predominance of high-tech development in major industries, which are the core of higher technological structure of the economy. According to A. Amosha [2], innovative activity in Ukraine is in the state of chronic crisis: a decrease in innovation activity of enterprises, level of commercialization of developments is observed, traditionally prevail minor improvements, almost no duplication processes of innovations take place. "Innovatization" by V. Novytskyi [5], as an active research and technological dominant of modern development and competitive activity appears objectively in response to the changing nature in correlation between science and industry, as well as their manifestation of their new functional correlation.

In the second quarter of 2013 domestic consumer demand remained the main driver of economic activity. Thanks to the consistently high rates of growth in real wages (9.3 % annually); private consumption grew by 7.1 % year on year, excluding seasonal factors increase made up 2.2 %. An additional factor of sustainable growth in consumer spending of households was lower prices for some goods and services, which contributed to increased costs for the purchase of clothing and footwear (20.8% year on year), household items and appliances (14.4 %). The high base of comparison last year was a major factor in reducing the gross accumulation of fixed capital (-19.7 % year on year) as decline in comparison with the previous quarter was only 0.9 % excluding seasonal factor. After reducing imports of natural gas there has been a significant reduction of working capital (by 23.2 billion USD), which resulted in decrease of gross accumulation by 53 % year on year.

Export of goods and services in the second quarter decreased by 14.4 % year on year and by 5.6% excluding seasonal factors. The largest decrease occurred in the export of food products (-27.1 % year on year) due to the decrease in exports of grain by 45%. Among the causes of significant reduction in grain exports were:

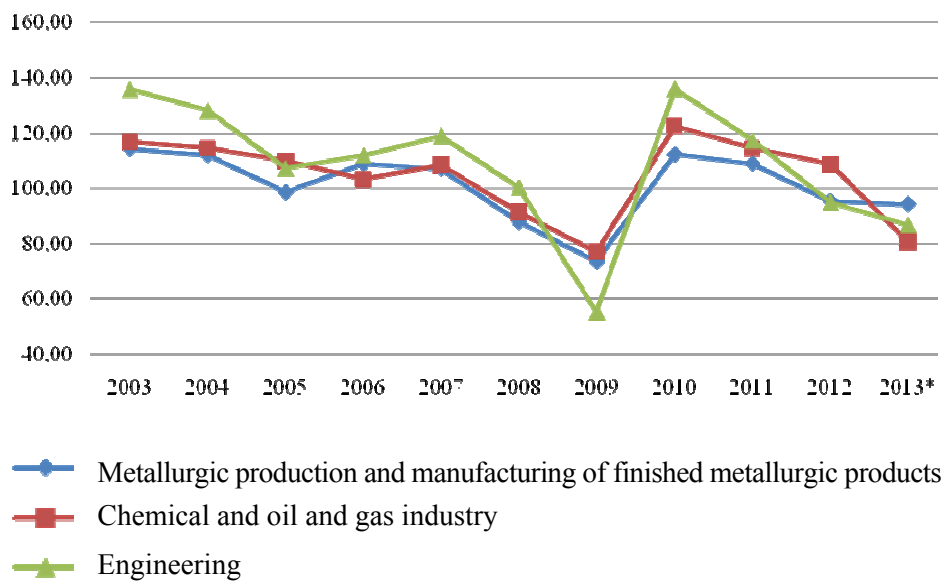
- lower prices for grain in the world, therefore the Ukrainian exporters did not sell out their production;
- high prices for grain handling and transportation costs in Ukraine;
- smaller grain harvest in 2012 than in 2011;
- high base of comparison last year – grain exports in the first half of 2012 increased by 95 % compared with the same period last year.

Besides, due to low external demand exports of steel production fell by 6.4 % year on year, engineering – by 8.2 %, chemical products – by 5.5 %.

For the first time since the first quarter of 2010 the rate of import changes was lower than the rate of export changes. Reduced imports of goods and services in the second quarter of 2013 were 19.1 % year on year. The greatest decrease occurred in imports of products of the energy sector (42.5 % year on year) due to lower natural gas imports (-54.7 %) caused by the diversification of natural gas supplies. Introduction of duties on imports of cars by government since 13 April this year led to a decrease in imports of machinery by 17.9 % year on year.

Economic activity in the second quarter of 2013 continued to be determined by the high level of domestic demand and unfavorable foreign economic conditions. The largest negative contribution to the change in GDP was by industrial production (-1.5 gp), the volume of which in the second quarter decreased by 5.7 % year on year (-5 % in the first quarter) [9].

Low external demand led to a negative trend in export-oriented industries. The decline in manufacturing industry was 7.5 % year on year, engineering – 12.4 %, chemical industry – 16.7 %, their total contribution to the change in industrial production in the second quarter amounted to 3.9 gp (*figure 1*).



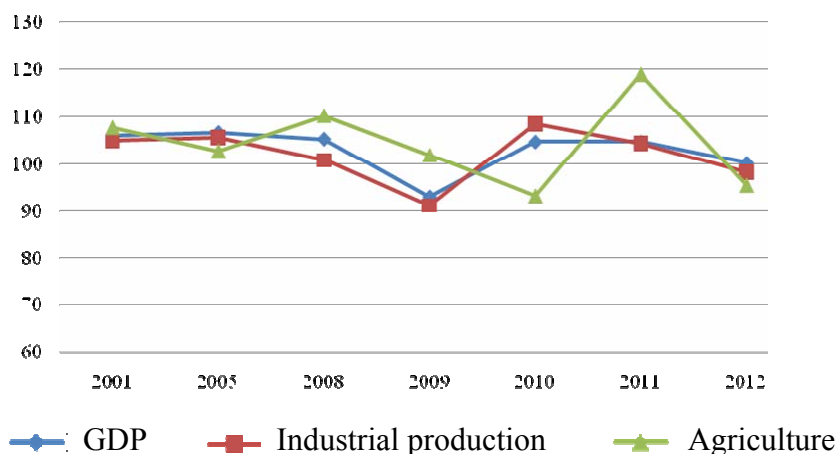
**Figure 1. Indexes of production output in 2003 – 8 months of 2013 in Ukraine (in% to the same period of the previous year) [10]**

Among the negative factors that influenced the dynamics of industrial production in the 1 half of 2013 were:

- reduced demand and, respectively, prices for steel, which resulted in the decline in manufacturing industry output by 7.8 % year on year;
- recycling collection for cars, put into effect by the Russian Federation on September 1 last year. As a result, manufacturing of passenger cars in Ukraine in the first quarter fell by 63.4 % year on year, trucks – by 67.7 %;
- suspension by the Russian Federation of the effect of certificate for output of Kremenchug steel manufacturing plant, which affected the performance carriage industry – the amount of output decreased by 41.9 %;
- the excess of the natural gas prices for Ukraine over prices for Belarus, which reduces the competitiveness of Ukrainian in chemical production, which in its turn makes domestic producers cut down production;
- high oil prices and import duties, which reduce the profitability of oil products, caused Ukrainian refineries to stop working. The output of coke and oil products in the second quarter decreased by 13.3 % year on year [9].

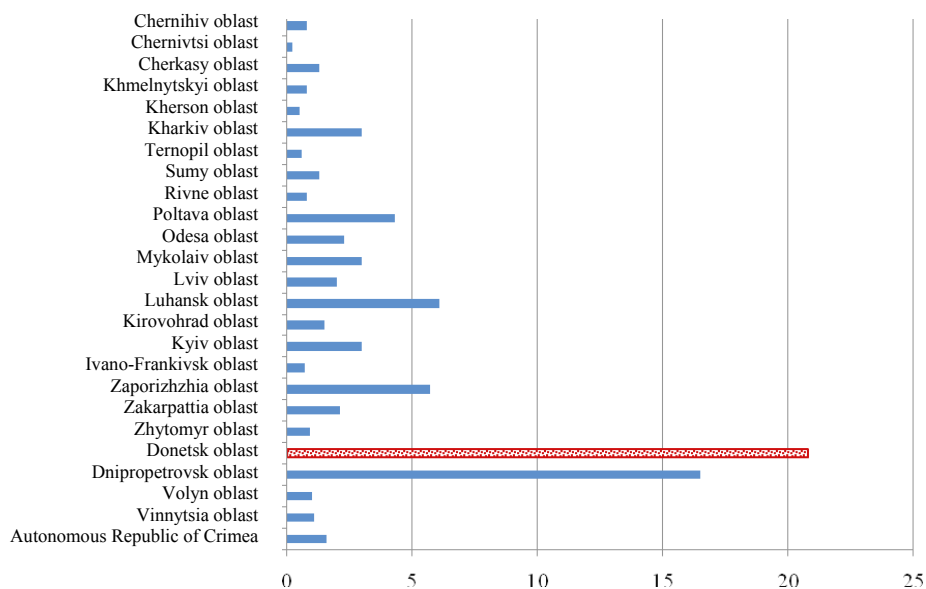
The negative impact of low external demand is somewhat offset by a significant improvement in performance of agriculture. A significant increase in the grain crops yield this year contributed to an increase in output of agriculture in the second quarter by 20.9 % year on year, which provided in 0.9 gp in annual GDP change (*figure 2*).

High domestic consumer demand, supported by steady growth in real wages (+9.3 % in the second quarter year on year), provided growth of retail trade turnover by 9.4 % year on year.



**Figure 2. Indexes of GDP, industrial production and agricultural output in 2001–2012 in Ukraine (in % to previous year) [10]**

Traditionally, Donetsk region occupies a leading position among the regions of Ukraine in visible exports. In January–August 2013 industrial production index in Donetsk region compared with January–August of the previous year was 91.6 %. The decline in industrial production since the beginning of the year is still associated with a decrease in demand in foreign markets for metal, resulting in metallurgy manufacturing and manufacturing of finished metal products output in January–August 2013 is less than in the same period in 2012 by 7.5 % [11]. Despite the decline in exports, in the first six months of 2013 region remains in first place in Ukraine according to this indicator, its share was 20.8 % (figure 3).



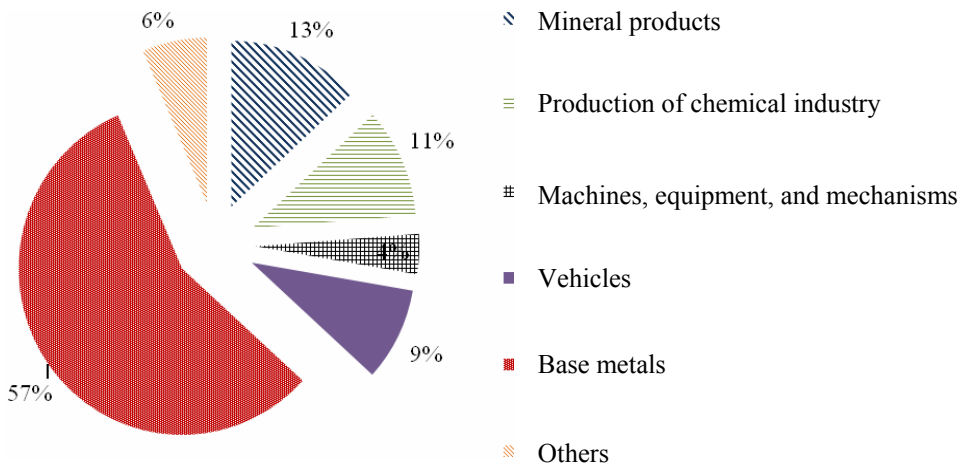
**Figure 3. Place of Donetsk region in Ukraine's export potential (January–August 2013) [10]**

Products made in the region are exported to 139 countries. Exports to CIS countries during 2012 decreased compared to 2011 by 6% and amounted to 4.7 billion USD, or 33.5 % of the regional total. Exports to Russian Federation, the largest foreign trade partner of the region, decreased by 17.5 % and amounted to 3.1 billion USD, or 21.9 % of total foreign exchange earnings in the region.

The volumes of supply in Europe (excluding CIS) for 2012 amounted to 3.1 billion USD, or 21.9 % of regional exports. Compared with the previous year, they decreased by 36.5 %. The largest European consumer of Donetsk region goods is Italy. Its share in the regional volume of exports is 8.7 %. During 2012 the volume of exports to that country decreased by 40.5 % and amounted to 1.2 billion USD, including 90 % of deliveries received from ferrous metals export.

More than a half (54 %) of innovative products sold by enterprises of the region was exported (the national average – 37 %), two thirds of the supply both in the region and in general in Ukraine accounts for the countries of the CIS. Almost a half of the regional volume of sales of innovative products provided enterprise of machinery manufacturing, more than 40 % – metallurgy, 7 % – food industry [11].

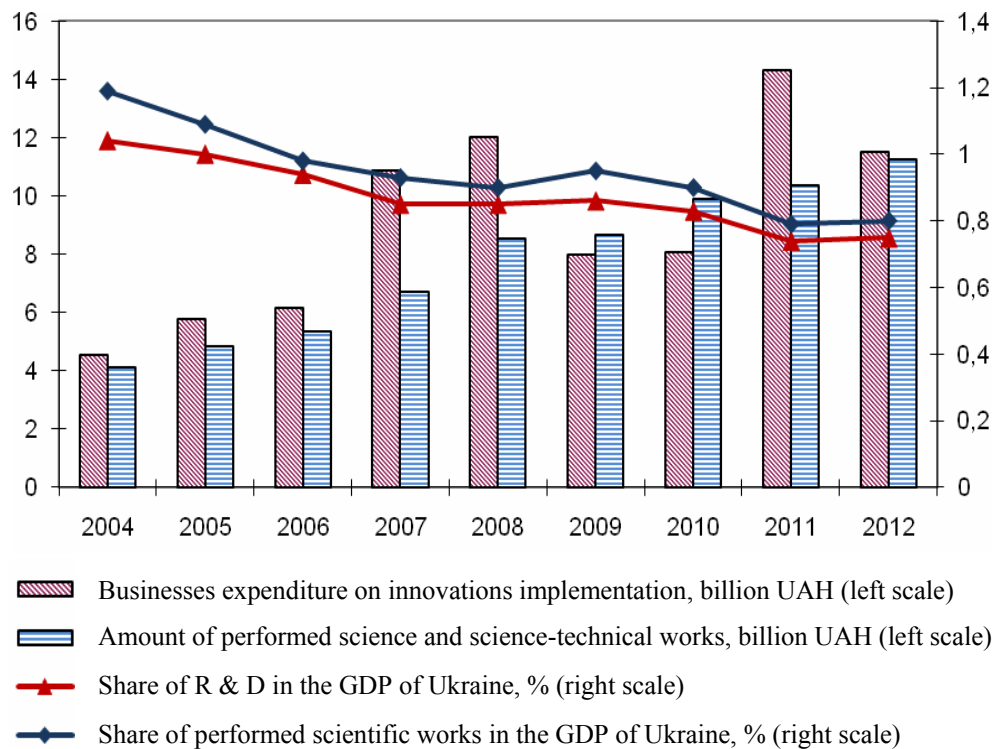
In the commodity structure of regional exports 54.7 % accounts for ferrous metals (*figure 4*). During 2012 regional companies supplied them across the borders of Ukraine by 7.7 billion USD, which is by 27.4 % less than the previous year. The volume of exports of machinery, equipment, vehicles decreased in 2012 compared to the previous year by 4.9 % and amounted to 1.8 billion USD. The share of machinery manufacturing in regional exports accounted for 12.4 %, which is 4.4 times less than ferrous metals [11].



**Figure 4. Structure of commodity exports of Donetsk region in 2012 [11]**

Export orientation of industry in the Donetsk region has always been an important factor in its development, but at the same time it turns out to be the vulnerable point for the entire economy through unpredictable changes in foreign trade situation. An alternative to foreign trade could be the development of internal market. However, it does not decrease the relevance of the development of new foreign markets and improvement of the export structure by increasing the proportion of products with high added value.

The realities of the current economic situation in Ukraine show that in contrast to developed countries which provide up to 85–90 % of GDP growth by producing high-tech products for export, our country, having the leading position by the number of scientists in the world does not enough use its innovative potential in full. Market of scientific and technical products continues to deteriorate due to the small demand for innovations due to the low solvency of domestic consumers. Therefore, the situation in the sphere of innovations in Ukraine is still dissatisfactory: if in developed countries the share of innovation active enterprises is within 60–70 %, we have about 12 % [12] (figure 5).



**Figure 5. Innovative constituent of Ukrainian economics development**

Today, innovation processes in the domestic industry mainly have extensive character, and new products are being developed mainly through the use of scientific and technological achievements of previous years. This type of innovation development has fairly narrow limits and makes it

impossible to maintain competitiveness at an appropriate level for a long time. Ukraine's share in world trade volume of high-tech, knowledge-intensive products is very low – only 0.1 %, which is much less than that of Poland and Germany.

The main goal of reforming the industrial production, which currently provides a significant part of economic growth, is to increase its competitiveness through technological upgrading of enterprises and optimizing the structure of products they produce, reducing the energy intensity of production, etc.

Development and implementation of scientific and technological potential of the industry will allow making improvements in the technological industrial structure by overcoming scientific and technological lag that must be carried out within the framework of Ukraine's transition to innovative breakthrough strategies. It is necessary to support innovation activities of enterprises, including in the framework of international cooperation development, stimulate demand for innovation and their active implementation in the industry, to bridge the gap between science and industry, to promote the commercialization of national scientific and technological developments in the enterprises of Ukraine, to provide patent-licensing safety of domestic companies.

Technological structure (TS) is a conglomerate of connected industries, combined in a steady wholeness that perpetuates itself by means of technological chains, covering a closed reproductive cycle – from production of inputs and training staff to nonproductive consumption. Today, in developed countries dominate technologies of 5-th structure and are emerging technologies of 6-th structure. In the industry of Ukraine dominate 3-rd and 4-th structures.

Regarding modern technological structure in the industry of Ukraine, it, according to the calculations, has the following structure: the third technological structure – 50.4 %, the fourth – 44.56 %, the fifth – and the sixth 4.99 % – 0.05 %. This technological structure describes the economy of Ukraine in the long term as "raw material" and demonstrates technological degradation of the country. If in the 80-s of the twentieth century in the structure of Ukrainian industry and commodity export share of machinery manufacturing amounted to 30–40 %, and ferrous industry – in 2–3 times less, than the current situation is directly opposed [13].

Replacement of technological structures as a rule requires corresponding changes in social and institutional systems. These systems facilitate mass adoption of new structure technologies appropriate to the type of consumption and lifestyle. Upon completion of this begins a phase of rapid expansion of new technological structure, which is the basis for economic growth and has a dominant position in the economic structure. In the growth phase of a new structure most technological chains are rearranged according to its needs. At the same time, further, newest TS are emerging, which is in the embryonic phase until the dominant structure reaches its growth limits,



followed by the next technological revolution. This creates a new kind of infrastructure that overcomes the limitations of previous as well as the transition to new energy resources, which provide the basis for the formation of the next technological structure [4].

These data indicate that in the structure of manufactured industrial products prevails the share of 3rd technological structure. Consequently, the industry is dominated by low added value branches, which consume a significant portion of electricity. It can be noted that in the industry Ukraine prevails 3rd structure of technology in conjunction with the elements of 4th and 5th. With simultaneous reproduction of multiple technological structures of the economy there are some distortions such as reduced efficiency of industrial production, slowdown and deterioration of economic growth. Simultaneous reproduction of three technological structures as a result of general resource constraints leads to a slowdown of performance of each of them, as well as the overall rate of economic growth and a sharp slowdown of progressive structural changes.

Thus, the basis of the technological development of the national economy and the industry has to become a comprehensive modernization of production with the introduction of modern achievements of national and international science and technology. Priority industries that can provide high technological development Ukraine, are defined the following:

- machinery manufacturing (aviation, rocketry and transport machinery, power machinery, agricultural machinery manufacturing);
- instrumentation (technical re-equipment of communication and transport systems, the implementation of energy-saving technologies, production of diagnostic systems and medical equipment, component base and accessories);
- development of military-industrial complex manufacturing (manufacturing of radar systems, missile systems a wide range of supplies, facilities of space and radio communications);
- development of mining and metallurgical complex on the basis of resource saving, environmentally friendly technologies;
- development of chemical and petrochemical industry (manufacturing of rubber and plastic products, chemical and pharmaceutical industry);
- information technologies.

World experience of economic systems development shows that investment is a leading factor in leading countries (USA, Japan, EU, Latin America), in particular, encourage high level of technological development. Consequently, investment is the foundation for the revitalization of economic activities providing their orientation to the research and development areas.

For these reasons, there is an urgent need for the change in the structure of the industrial complex of Ukraine. This requires the adoption at the national level of tooled mechanism of fundamental forecasting and

analytical research that will enable to clearly and reasonably determine the scientific, technological and innovation priorities that will ensure the effectiveness of the national economy [14].

**Conclusion.** Thus, the problems that were faced by the national economy cause the need for systematization of knowledge about the possible ways of evolutionary transformation of economic, technological and institutional systems. To join the advanced countries Ukraine should in the short term move to the "new economy", creating and implementing in the real economy a "breakthrough" technology. It is necessary to enter international markets with intelligent databases, expert systems, microelectronics and other knowledge-intensive technologies.

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**Макогон Ю. Перспективи інноваційного розвитку економіки України.**

**Постановка проблеми.** Запропоновану наукову роботу присвячено дослідженню сучасного стану економіки України, аналізу структури зовнішньоекономічних операцій, визначенню частки інноваційної продукції в експорті України, а також проблемам подальшого розвитку інноваційного потенціалу України в системі міжнародного співробітництва.

**Огляд наукових джерел** з обраної тематики свідчить про відсутність цільового дослідження процесів модернізації та впровадження інновацій у промислове виробництво в Україні, що призводить до зниження інноваційної складової експортних поставок. В опублікованих працях здебільшого розглянуто сутність інновацій, а не проблема їх впровадження у виробництво. Актуальність визначених аспектів обумовили мету дослідження.

**Результати дослідження.** У роботі досліджено сучасний стан економічної ситуації в Україні, виділено перспективні напрями та галузі, що за умови системної кризи можуть стати локомотивами економічного зростання. Розглянуто роль областей, які формують експортний потенціал України, зокрема, наголошено, що саме у Донецькій області зосереджено більшість підприємств машинобудування, металургії та хімічної промисловості. За результатами дослідження географічної та товарної структури зовнішньої торгівлі України визначено, що в основному наша держава експортує товари з малою часткою обробки, що зумовлено застарілою технологічною структурою промислового комплексу.

Грунтовний аналіз інноваційної складової економічного розвитку України свідчить, що головною метою реформування індустріальних виробництв, які на сьогодні здебільшого забезпечують економічне зростання, є підвищення їх конкурентоспроможності на основі технологічного переоснащення підприємств та оптимізації структури продукції, що ними виробляється, зниження енергоємності виробництва тощо. Розвиток та реалізація науково-технологічного потенціалу промисловості дозволить здійснити позитивні зміни у технологічній структурі промисловості шляхом подолання науково-технологічного відставання, що має здійснюватись у рамках переходу України до стратегії інноваційного прориву.

**Висновки.** Проведене дослідження може бути складовою більш докладного вивчення процесу модернізації промисловості України та еволюційної трансформації економічної, технологічної та інституційної систем, що стане основою переходу економіки України до "нової економіки", створюючи й реалізуючи в реальному секторі економіки "проривні" технології.

**Ключові слова:** промисловість, економічне зростання, інновації, технологічний уклад, модернізація.